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Newspaper Publishers Must Cut Inventories

WPB In Amendment To Limitation Order L-240 Directs All Large Consumers of Newsprint In 26 States To Reduce Inventories To 50 Days' Supply—Regulation Becomes Effective On August 1, 1943.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 21, 1943—All newspaper publishers in the United States are required by the War Production Board to reduce their orders of print paper to their quota for consumption, and a majority of the publishers must, in addition, reduce their inventories from 75 to 50 days' supply, the WPB announced today in Amendment of Limitation Order L-240.

It is hoped that these two measures will reduce orders of print paper to meet available supplies, H. M. Bitner, Director of the Printing and Publishing Division of WPB, said. These regulations, effective August 1, 1943, are based on the recommendations of the Newspaper Industry Advisory Committee, which met here June 17.

Regulation Affects August Orders

Mr. Bitner pointed out that print pulp orders for August, if already placed, must be made to conform to the new regulation. It covers deliveries or acceptances of newsprint after August 1, regardless of the date on which the orders were placed.

Paper stocks are low and supplies are limited, despite the fact that both domestic and Canadian production facilities have been expanded to the utmost; therefore, the Printing and Publishing Division is endeavoring to effect an equitable distribution of available paper and this is being done without any distinction as to the type of newspaper, Mr. Bitner declared.

Publishers' Inventories Reduced

After August 1, unless specifically authorized, United States publishers may not accept delivery of print paper in any one month in excess of one-third of their current quarterly quota, plus a similar proportion of any additional quarterly tonnage granted by the WPB after an appeal, it was explained. The smaller papers whose deliveries, limited by the above, amount to a fraction of a carload, may, however, increase their receipts to one carload a month.

The purpose of the new delivery requirement is to keep United States newspaper publishers from ordering more paper than they actually require. Canadian deliveries, it was pointed out, now are limited to 210,000 tons per month. Recently, United States publishers ordered approximately 12-13% more paper than Canada had agreed to furnish, forcing Canadian authorities to reduce their deliveries by the above percentage. United States mills are also known to have received orders in excess of their present production of 61,000 tons a month, and to have experienced the same difficulty in filling orders equitably.

Inventories Held to Fifty Days' Supply

The new limitation holds inventories of each newspaper to fifty days' supply in the 26 northeastern states located north of the northern boundary of North Carolina and east of the Rocky Mountains and in the District of Columbia. Newspapers in these 26 states use approximately 80% of the print paper used in the United States. However, an inventory of 75 days is permitted in the 22 states in the South and on the West Coast. The two latter sections are more remote from sources of supply, and, as transportation facilities are inadequate and slow, they are permitted to retain an additional supply of newsprint in inventory. All inventories are based on average daily rate of consumption during the first six months of 1943.

Unless specifically authorized, no publisher may accept delivery of print paper if his inventory of paper on hand, available for use, or in transit exceeds two carloads, or, if in excess of two carloads, amounts to more than 50 or 75 days' supply, dependent upon his location under the inventory regulation.

To make these regulations and restrictions effective, the WPB today issued amended Limitation Order L-240 by adding a new paragraph (d), and relettering original paragraphs (d) and (e) as (e) and (f) respectively. The WPB also deleted sub-paragraph (1) of paragraph (e), and renumbered the succeeding paragraphs in Conservation Order M-241. This last action was taken to remove the maximum inventory limitation on paper stocks previously fixed by Order M-241 at 75 days' supply.

Specific authorizations will be issued to publishers requiring additional print paper to build up inventories which fall below minimum practicable levels and to balance orders with Canadian paper supplies, it was explained.

To Search Farm Woodlots for Pulpwood

Survey In Marathon County Reveals Quantities of Wood Which Farmers Consider Nuisance Brush — Crop Law Payment Bill Passes — Paper Mill Employees Hold Outings — Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 19, 1943—Farm woodlots in Marathon County, Wisconsin, will be combed during the coming months to help solve the impending pulpwood shortage. A survey has revealed that there are quantities of spruce, poplar and hemlock available that will be converted from what the farmer considers nuisance brush to a cash crop.

Mills are concerned about the logging camps that have been closed, and others with greatly reduced manpower because of the attraction of high wages in war industries. They are doubtful of obtaining enough wood from the northern areas and Canada, and are carrying their appeal to the farmers to cut from their woodlots everything of suitable maturity for pulpwood.

Carl Magnus, manager of the Wausau Paper Mills Company, Brokaw, Wis., declares that its wood supply usually is 18 months ahead, but has dwindled to a two-months' stockpile. If 70% of the farmers in Wisconsin would cut over their poplar, hemlock and spruce for sale to the paper mills, he announced, there would be no dearth of raw materials.

The Marathon Paper Mills Company, Rothschild, Wis., and the Mosinee Paper Mills Company, Mosinee, Wis., also are urging the farmers to bring in their wood. Mills have offered to pay the OPA ceiling prices. The Mosinee mill also is buying jack pine. Foresters and county agricultural agents have been urged by Donald M. Nelson, head of the War Production Board, to advise farmers on methods of cutting and marketing.

He announced that the War Manpower Commission has classed production of pulpwood as an essential war occupation.

The promotional campaign extending over several counties points out the enormous demands made on the mills for paper for a thousand war purposes, and that every farmer who takes the trees off his woodlot for the purpose is making a real contribution to the war effort, as well as receiving for himself dollars from what would otherwise be wasted.

Crop Law Payment Bill Passes

Although Governor Walter S. Goodland vetoed a bill passed by the Wisconsin Legislature assuring a full annual payment of ten cents per acre to counties for lands entered under the state forest crop law, the bill has now become effective. The Legislature reconvened last week and passed over his veto an appropriation of $45,000 for this purpose. Vast acreages have been set aside for reforestation under the forest crop exemption statute, and the funds derived from the state will be used for additional plantings.

Mill Workers Hold Outings

Picnic time is at hand for the employes of various paper and pulp mills. The Appleton Coated Paper Company, Appleton, Wis., will hold its annual outing Sunday, August 8, at Telulah park. Appleton. There will be a baseball game between the shift and day workers, and games, contests and entertainment. John Reeve, personnel manager, is in charge of arrangements.

The Paper Mill Workers' Union of the Kimberly-Clark Corporation mill at Kimberley, Wis., will hold a picnic in August at Sunset Point, near the village. The date will be set later. Ray Haase, president of the union, is in charge of arrangements.

Hartman-Polansky Nuptials

Miss Dorothy Polansky of the stenographic department of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., was married July 1 to Lieut. Edwin J. Hartman, formerly of Wisconsin Rapids. The ceremony was performed at SS. Peter and Paul, Wisconsin Rapids. The couple will reside at Keystone Heights, Fla. Lieut Hartman entered the army in 1941 and is stationed at Camp Blanding.

Miss R. T. Mead Dead

Miss Ruth Tittcomb Mead, 80, sister of George W. Mead, president of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., died July 15 at Mercy hospital, Chicago. She had resided in California for the last twenty years. While on her way to Wisconsin Rapids in company with Mr. Mead, she fell during a stopover in Chicago and suffered a broken hip. Mr. Mead had gone to Chicago several days before her death to convey her to his home in an ambulance.

Fall N.P.T.A. Convention Cancelled

Arthur H. Chamberlain, executive secretary of the National Paper Trade Association, has sent out the following notice which is self-explanatory:

Acting President Kettles recently referred to the executive committee the question whether or not we should cancel our usual fall convention as was done last year in recognition of the views of the Office of Defense Transportation. The executive committee voted for cancellation but with the hope that sanction might be obtained, the executive secretary submitted the question to the ODT office in Washington last week.

The representative of J. B. Eastman, Director of ODT, very emphatically and definitely expressed the view that such meetings should not be held this year and subsequently addressed to this office a confirming letter stating that while they can only appeal on a voluntary basis, they ask that "the officers of our association seriously consider the cancellation of our September meeting."

Acting President Kettles feels that this request must be regarded as mandatory and therefore authorizes the announcement that our usual semi-annual meeting will not be held this year. This is especially regretted because of the disappointment of members in the Western area whose convenience is served by the Chicago meeting. A regional meeting in Chicago the latter part of September is now under consideration.

Chicago Reports Scarcity in Kraft Paper

Unfavorable Pulp Outlook and Current Tight Paper Market Is Attributed To "Bungling" By Government Agencies—Kraft Papers Are Scarce and Demand Is Heavier For Many Sulphite Grades.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., July 19, 1943—What several Chicago leaders think of the pulp situation is revealed in another paragraph on these pages, but the pulp problem is by no means limited to the gentlemen quoted. A real need for a break in the "log jam" coming through recognition of the manpower problem and the importance of paper along with the War and home fronts, is the paramount topic of discussion in this market. The conservation plan suggested by the Association of Pulp Consumers is being widely discussed while the "end use" program here in Chicago is increasing in tempo as forecasts predict grave shortages in certain lines before the snow falls.

Krafts were experiencing almost certain scarcity of major proportions, according to local merchants. Groundwoods and newsprints were in heavy demand with pulp outlook here coupled with the price situation to make the picture doubly perplexing. Sulphites remained very strong in all grades while books and covers were at a near peak, with no signs of a summer let down. Waste papers, particularly the higher grades, were showing no evidence of any increase that would help the over all picture.

Lay Pulp Shortage to "Bungling"

Chicago leaders in the coarse paper industry came flatly into print this week to lay the paper and bag famine to "bungling" of the pulp program. On July 14, the Chicago Tribune printed an entire column quoting W. E. Beier of Beier & Company; W. J. Henry, Sr., Souther Advance Bag and Paper Company and other leaders of the local industry. The consensus of opinion seemed to be that shortage of pulpwood because of the "blundering of New Deal agencies" already has curtailed the production of kraft paper so radically that stores and shops will be without paper bags and wrapping paper in less than six months unless corrective steps are taken now."

Mr. Beier declared he had orders calling for more than 100,000 pounds of kraft paper which he cannot fill. Mr. Henry stated that "while we still have as many trees as ever, production is down because there are no workers to cut the trees. Mills have been forced to shut down frequently for varying periods because they have no pulpwood. If even this reduced tonnage was properly distributed I believe we would still have sufficient paper for all needs. Provided, of course, the government does not over-buy as it has so frequently in the past."

Blunders by the selective service and manpower commissions "in taking an unwarranted number of men critically needed for pulpwood cutting" were revealed in the comments. Stocks are running low and, said one merchant, "we are betting our woodpile that the war will be over in eight months. Unless we win the war in that time we will be out of business."

Leaders here pointed to the consumption of a pound of paper a month by every man, woman and child in the U. S. in 1937 to show its importance in industry and civilian life.

Salesmen Schedule Ten Speakers

John Timm, representing the Department of Finance of the State of Illinois, and J. T. Meek, executive head of the Illinois Federation of Retail Associations, will provide the guest speaking talent at the July 19 meeting of the western division of the Salesmen's Association of the Paper Industry, according to R. D. Patterson, Flambeau Paper Company, program chairman for the day. Mr. Timm is expected to explain new sales tax rulings affecting shipments into the State while Mr. Meek is to discuss the many tribulations now confronting distribution because of lack of attention to basic home front problems. Final plans will also be made for the second of the golf outings to be held July 24.

New Uses for Paper

From the Chicago headquarters of the Walgreen Company, big drug chain, comes news of another big demand for paper products. The company has provided for use of paper containers at many of its drug fountains and expects the list of stores using this feature to grow rapidly. Smooth plastic holders and cone shaped cups in 7, 8 and 12 ounce sizes are proving very popular with the consumer public.

Discuss Foreign Credit Matters

A new and popular division of the Chicago Association of Credit Men—the Foreign credit discussion group—held its second meeting on July 15. Nearly 40 export credit officials attended the meeting as compared to the 22 who instigated the round table discussion program. Several paper trade executives were reported in the group.

To Investigate B. C. Lumber

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., July 16, 1943—Thorough and detailed investigation of every phase of British Columbia's lumbering industry may be expected to get underway before the end of the summer.

Premier Hart stated recently he and members of his government would consult within the next two weeks with parties interested in logging and lumbering preparatory to setting up a board of enquiry which will make a thorough survey.

"Our objective is a long range policy of protecting the lumber industry of the province," Mr. Hart said, after a morning cabinet consultation with Hon. Wells Gray, Minister of Lands, who is in charge of forestry matters.

"Our discussions with interested parties in the next two weeks will cover timber protection and reforestation," the Premier said. "It is our intention to get the viewpoint of the various sections of the lumber business in order to get a survey set-up going in a practical way.

"In other words we plan an enquiry into the whole forestry procedure of the province and perhaps follow as far as possible the best methods of other countries."

Awards are Made for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 21, 1943—Barton Duer & Koch Paper Company has been awarded the contract for furnishing the Government Printing Office with 817,200 pounds of 50% rag, white index paper at 13.25 cents. Other paper awards recently announced include the following.

Marquette Paper Company will furnish 800,000 pounds of groundwood writing paper at 6.50 cents and the R. P. Andrews Paper Company will furnish 21,600 pounds of white Hammermill duplicator paper at 10.05 cents. Marquette Paper Company will also furnish 1,000,000 pounds of white sulphite writing paper at 7.30 cents and the R. P. Andrews Paper Company will furnish 49,000 pounds of 50% rag white glazed manifold paper at 26.78 cents.

Barton, Duer & Koch Paper Company will furnish 11,700 pounds of 100% rag, white ledger paper at 21.65 cents and the Marquette Paper Company will furnish 40,750 pounds of chemical wood green writing paper at 8.25 cents. The Cauthorne Paper Company will furnish 118,400 pounds of 25% rag, white mimeograph paper at 9.13 cents and the Whitaker Paper Company will furnish 40,000 pounds of tan bristol cover board paper at 5.25 cents.

The Stanford Paper Company will furnish 151,700 pounds of semi antique Whitag paper at 11 cents and the same firm will also furnish 320,000 pounds of blue white aero litho chart paper at 15 cents. The Cuneo Press, Inc., will furnish 1,890,000 pounds of white machine coated paper at 6.89 cents and R. P. Andrews Paper Company will furnish 75,600 pounds of poster paper at 7.35 cents.

Walker Goulard Plehn Company will furnish 18,300 pounds of white coated book paper at 11.25 cents and the R. P. Andrews Paper Company will furnish 14,250 pounds of tea antique finish cover paper at 8.67 cents. Lanston Monotype Machine Company will furnish 20,000 pounds of monotype keyboard and casting machine paper at 14 cents. Walker Goulard Plehn Company will furnish 12,650 pounds of 25% rag, yellow bond paper at 15.6 cents.

Walker Goulard Plehn Company will furnish 20,000 pounds of 25% rag, white bond paper at 13.85 cents and the same firm will also furnish 45,570 pounds of white Zena coated paper at 9.9 cents. Bulkley Dunton & Company will furnish 142,500 pounds of blue white aero litho chart paper at 17.76 cents and the same firm will also furnish 240,625 pounds of the same at 17.75 cents.

The Mead Corporation will furnish 40,000 pounds of Chestnut cover paper at $75.00 per ton and Jessup & Moore will furnish 45,000 pounds of 25% rag, white mimeograph paper at 9.9 cents. Mathers-Lamm Paper Company will furnish 48,000 pounds of moss green blotting paper at 9 cents and the Paper Corporation of U. S. will furnish 68,800 pounds of high finish sulphite manila tag board at 6.84 cents.

Franklin Research Company will furnish 249,600 pounds of 50% rag white nautical chart paper at 18.5 cents and the following quantities of the same paper at the same price; 181,750 pounds; 160,500 pounds; 172,250 pounds; 9,080 pounds and 8,620 pounds.

North American Pulp and Paper Company will furnish 63,000 pounds of white chemical wood index paper at 8.5 cents and Barton Duer & Koch Paper Company will furnish 1,228,800 pounds of white chemical wood writing paper at 8.25 cents. Cauthorne Paper Company will furnish 30,000 pounds of 25% rag, yellow bond paper at 14.21 cents and Barton Duer & Koch Paper Company will furnish 644,800 sheets of 50% green index paper at 14 cents and 959,000 sheets same buff at the same price.

Frank Parsons Paper Company will furnish 300,000 pounds of canary ground wood writing paper at 5.55 cents, and the same firm will also furnish 188,619 pounds of same at 6.05 cents and 62,500 pounds of same at 6.48 cents. Paper Corporation of U. S. will furnish 95,500 pounds of tan bristol cover at 9.65 cents.

Central Ohio Paper Company will furnish 35,100 pounds of 25% rag, white ledger paper at 13.74 cents and the same firm will also furnish 31,200 pounds same yellow at 13.74 cents. George La Monte & Son will furnish 120,000 pounds of Sensicoat book paper at 22.75 cents and the Old Dominion Paper Company will furnish 64,800 pounds of 25% rag, mimeograph paper at 10.28 cents.

Paper Corporation of U. S. will furnish 250,000 pounds of book paper at 7.2 cents and the Cauthorne Paper Company will furnish 16,700 pounds of kraft wrapping paper at 5.5 cents. R. P. Andrews Paper Company will furnish 366,000 pounds of sulphite tan bristol cover paper at 8.9 cents.

Franklin Research Company will furnish 40,000 pounds of 50% rag white chart nautical paper at 18.5 cents and the same firm will furnish 134,750 pounds and 104,000 pounds same at the same price.

To Produce More Shipping Sacks

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 21, 1943—Production of an additional 70,000,000 paper shipping sacks a year without increases in the use of paper, machinery, or manpower is expected to result from an order issued today by the War Production Board.

Although the output of paper sacks—urgently needed for shipping a wide variety of important products—will be increased by the WPB action, 20,000 to 30,000 tons of virgin wood pulp will be saved.

The order (L-279 as amended today) places restrictions on the grade, quality and weight of paper which may be used in manufacturing larger size paper shipping sacks. Limitations also are placed on all paper sack users' inventories.

The restrictions on the grade, quality and weight of paper become effective on July 19, and those on all users' inventory, today.

During 1942, total production of paper shipping sacks was approximately 285,000 tons of sacks. At present, production is running at about that rate, although earlier in 1943, it had dropped to a rate of only 260,000 tons of sacks a year. If sacks are substituted for more critical packagings, as is anticipated, production will have to be stepped up to approximately 400,000 tons a year.

The amended order is designed to aid in achieving that goal.

The order is expected to result in a saving of approximately 8% of the total amount of paper used in the manufacture of paper shipping sacks annually.

On top of . . . *tomorrow!*

Funny place for a man to make his office—especially if he doesn't happen to belong to an "open-air" cult.

But watching which way the wind blows is serious business these days, for war is constantly altering the direction which industry will take when peace returns. Shifts are sudden . . . and their effects are felt in unexpected places . . . influencing products, transforming plans.

From his panoramic vantage point the Wyandotte man is keenly attuned to the trend of events affecting users of chemicals. Alert to developments in the offing *now*, he is uniquely qualified to help you foresee the future's form.

In our technical laboratories, research continues on new applications of chemicals . . . new techniques to increase their efficiency and facilitate their handling. These war-born skills—teamed with a long-range *awareness* of what's doing in the world of industry—make Wyandotte a useful ally to call in.

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New Paper Price Interpretations

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 21, 1943—The Office of Price Administration has distributed a series of interpretations of various price schedules and regulations affecting paper and paper products. These show the following:

Waste Paper: Price Determination; unlisted grade —Price is effective as of application date, where maximum price has been proposed and subsequently approved by OPA;

Export Packaging—Following do not constitute "special packaging" under section which permits addition for special packaging for export; packaging in 500 pound bales; affixing labels to show bale number and weight; preparing loading record of bale number and weight;

Printed Wall Paper Waste is not classified as No. 1 Mixed Paper.

Miscellaneous Paper Products:

Paper jackets for pass books, plain or printed, subject to Regulation 129 as "envelopes"—where printed by other than manufacturer, this service subject to Regulation 225 (Printed Paper Commodities).

Specialty bags: Held not "paper containers";

Standard Newsprint Paper: Where a company purchases newsprint paper from which it manufactures another product, sale of such product not subject to Regulation 130:

Printed Paper Commodities: Regulation No. 225—Sample cards to which are affixed swatches of thread, yarn, fabric or linoleum, with printed matter describing these, and giving name and address of seller are "advertising matter printed on paper, not falling within listed items under No. 225 and are exempt from price control.

Sputum Cups; Subject to Regulations 187 as "folding carton."

Price Determination on toilet tissue, base period price; manufacturer sold 750-sheet rolls of toilet tissue during base period, October 1-15, 1941, and now proposes to sell for first time a 650-sheet roll. He determines the maximum price for the new roll by using the formula in Sec. 1347.515 (a) (1). In order to determine 95 per cent of his October 1-15, 1941 price for 650-sheet roll, manufacturer takes 65/75 of his October 1-15 1941 price for 750 sheet rolls, and multiplies resulting figure by 95%. Sales not on uniform nationally delivered basis—established differentials—Manufacturer ships toilet tisue and paper towels in pool cars to railroad siding, and hires local firm to deliver to wholesale grocers. In no event may wholesaler pass on this delivery charge, because it is not "an established differential" and therefore not part of manufacturer's maximum on which wholesaler's mark-up is based;

Signatories of voluntary agreements—the term "most nearly competitive seller of the same class" includes non-signatories.

Issues Pulpwood Campaign Plan

The War Production Committee of the Pulpwood Consuming Industries, 1433 R. C. A. Building, Rockefeller Plaza, New York, has just issued a folder, with specimens of newspaper publicity, describing its campaign plan. It explains how the drive will be conducted, the basic work of the committee, government, newspaper, magazine and the importance of individual mill participation in the drive to increase the available supply of urgently needed pulpwood.

In reference to the pulpwood crisis, the committee states in part that, according to Arthur G. Wakeman, Chief of the Pulp and Paper Branch of the War Production Board, American pulpwood production, which this year should attain 13,000,000 cords, will fall short over 2,500,000 cords. Canadian production is falling rapidly. Pulpwood production in the United States was off more than 22% in the first four months of 1943. Mill inventories are being depleted at the alarming rate of 130,000 cords a month. Contracts for wood to be converted in 1944 are now 44% below normal.

Declaring that the pulpwood crisis affects all mills, the committee goes on to say that the government allocation of pulp and now the allocation of pulpwood, will tighten the controls which presently affect all mills, and to a greater extent as the situation becomes worse.

The most important constructive steps which are urgently required, the committee points out, are the following: (1) Make known the importance of pulpwood to the war effort. (2) Farmers can be urged to give three extra days a year to cutting pulpwood. (2) Efforts can be made to lessen the absenteeism from pulpwood cutting—this would have a tremendous effect in the south where negroes are employed. (4) In the north, during the winter months, farmers can be urged to cut more wood off their land or go into wood cutting operations.

M. A. King Now With Worthington

The Worthington Pump and Machinery Corporation announces that Marcello A. King has joined the organization as executive engineer of its Moore Steam Turbine Division, Wellsville, N. Y., in charge of design, research, testing, and service. Engaged in turbine engineering and manufacture since his graduation from the University of Michigan in 1916, he was with the Kerr Turbine Company and later with the Elliott Company where he held the position of manager of engineering. Mr. King has been active in trade association work and is widely known in the steam power field.

"The ABC of Electronics at Work"

The fundamental principles of the six basic ways in which electronic tubes function are explained in a new 36 page booklet announced by Westinghouse Electric and Manufacturing Company.

Schematic drawings of the tube construction and diagrams showing the typical circuits for the various functions are used to explain how electronic tubes rectify, amplify, generate, control, transform light into current and current into light. Industrial and military applications for each of the six basic functions are described and illustrated in this booklet, "The ABC of Electronics At Work." High frequency heating, dynetric balancing, resistance welding control, radio and radio-telephony, television, Precipitron, industrial and medical x-ray are a few of the electronic devices that are included.

A copy of booklet B-3260 may be secured from Department 7 N 20, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

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- Oil and Gas Gathering Lines.
- Swing Pipe.
- Spray Pond Piping.
- Hydraulic Mining.
- Dredge Lines.

"Over-designing" is bad practice, too!

EVERYONE knows that it's dangerous to "under-design" where piping and pressure vessels are concerned. But let's be consistent and admit that "over-design" is bad practice too—that providing weight and strength which serve no useful purpose just isn't good engineering.

Rarely if ever is the mistake made of using pipe that is too light for safety, for when conditions are severe, strength requirements are calculated with commendable care. A mistake that often is made, though, is using too-heavy pipe for the ordinary run of low and moderate pressure services. The mistake, in short, of using Standard Thickness Pipe for *every* service that doesn't require something heavier.

As a matter of fact, it's a pretty good bet that Taylor Spiral Pipe could handle adequately, with strength and service-life to spare, a large percentage of the working pressures carried in your plant —that its use would represent sound engineering and good design.

And when it comes to economy—well, the installed cost of Taylor Spiral Pipe is often no more than half that of the heavier pipe it so well replaces.

Switching to Taylor Spiral Pipe for services like those listed here is made practical by the range of sizes and variety of fittings. Thicknesses range from 18 to 6 gauge; joint lengths to 40 ft. All types of end joints, all kinds of fittings and "specials" or fabricated assemblies are produced, providing a complete service with undivided responsibility.

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TAYLOR *Spiral* PIPE

Paper Requirements Can be Met

WASHINGTON, D. C., July 21, 1943—The increasing paper requirements of the United States, accelerated by war conditions, are creating an increased pulpwood drain on the nation's forests, according to the U. S. Department of Agriculture. However, there is no apparent reason why future requirements cannot be met, provided the forests are kept in productive condition.

To meet urgent war requirements, increased production is necessary and foresters are urging increased cutting of pulpwood, especially from farm woodlands, under good forest management practices that will not jeopardize future growth.

As to longe range prospects, the Department's Forest Service says that continued research in wood utilization may help to increase the available supply by making it possible to use certain woods not now used for pulp and paper. Increased integration of pulpwood production with lumber operations could produce paper from tops of trees and other material now often wasted in logging. In the long run, however, management of this country's forest lands for permanent production will be necessary to insure adequate and continuing supplies of pulpwood.

Broadly speaking, the United States is at present self-sufficient in pulpwood for sulphate and soda pulps, used mainly to make paper boards and wrapping paper. This is not true, however, for the sulphite and mechanical pulps which go into newsprint, book, and other fine papers. The spruce, fir, and hemlock from which these pulps are made grow mainly in the northern sections, and about 70% of the readily available pulpwood of this kind is in Canada.

To this considerable extent the United Sttes is dependent upon the forests of Canada. The eastern forests of both countries are overcut, and economic conditions will probably bring about a greater utilization of the hemlock, spruce, and fir in the Pacific Northwest, the Forest Service says. Continued cooperation between the United States and Canada, together with adequate measures to maintain the productivity of U. S. forests, will assure sufficiency of pulps of all kinds in North America.

Since 1860, the total amount of pulpwood consumed in the United States has been some 237 million cords, according to the Forest Service. Approximately 220 million cords, or 93% of the total was consumed since 1900. Of the total consumption, 16% was imported, mostly from Canada.

Per capita consumption of "cultural" papers (newsprint, book, etc.) increased from 26.6 pounds in 1899 to 89.3 pounds in 1940; and of utility papers (boards, wrapping, etc.) from 31.1 pounds in 1899 to 160.7 pounds in 1940.

Appoint Fine Paper Committee

WASHINGTON, D. C., July 21, 1943 — Nineteen merchants of fine papers, located in various parts of the country, have been appointed members of a fine Paper Merchants' Industry Advisory Committee, the Office of Price Administration announced today.

Members of the committee, who represent both large and medium sized firms, will consult together and advise OPA in connection with regulations governing price ceilings on fine papers at the merchant level.

Appointment of this committee is in line with OPA's policy of extending the use of industry advisory committees throughout the agency.

The committee follows:

C. A. Estey, Carter, Rice & Company, Boston; J. R. Whitney, Whitney-Anderson Company, Springfield, Mass.; J. W. Holt, Rourke-Eno Paper Company, Hartford, Conn.; O. F. Marquardt, Marquardt & Company, Inc., New York; M. Schlosser, Schlosser Paper Company, New York; R. M. Harris, Alling & Cory Company, Rochester, N. Y.; T. S. Furlong, Wilcox-Walter-Furlong Paper Company, Philadelphia; W. N. Schaefer, R. P. Andrews Paper Company, Washington, D. C.; J. W. Knight, Knight Bros. Paper Company, Jacksonville, Fla.; W. G. Cleveland, E. C. Palmer & Company, Ltd., New Orleans, La.; P. A. Harris, Graham Paper Company, St. Louis, Mo.; A. M. Miller, Central Ohio Paper Company, Columbus, Ohio; W. N. Gillett, Chicago Paper Company, Chicago; N. A. Altman, Butler Paper Corporation, Chicago; P. W. Lesh, C. P. Lesh Paper Company, Indianapolis; A. W. Leslie, John Leslie Paper Company, Minneapolis; D. A. Hoadley, Carpenter Paper Company, Omaha; H. Zellerbach, Zellerbach Paper Company, San Francisco, and A. W. Towne, Blake, Moffit & Towne, San Francisco.

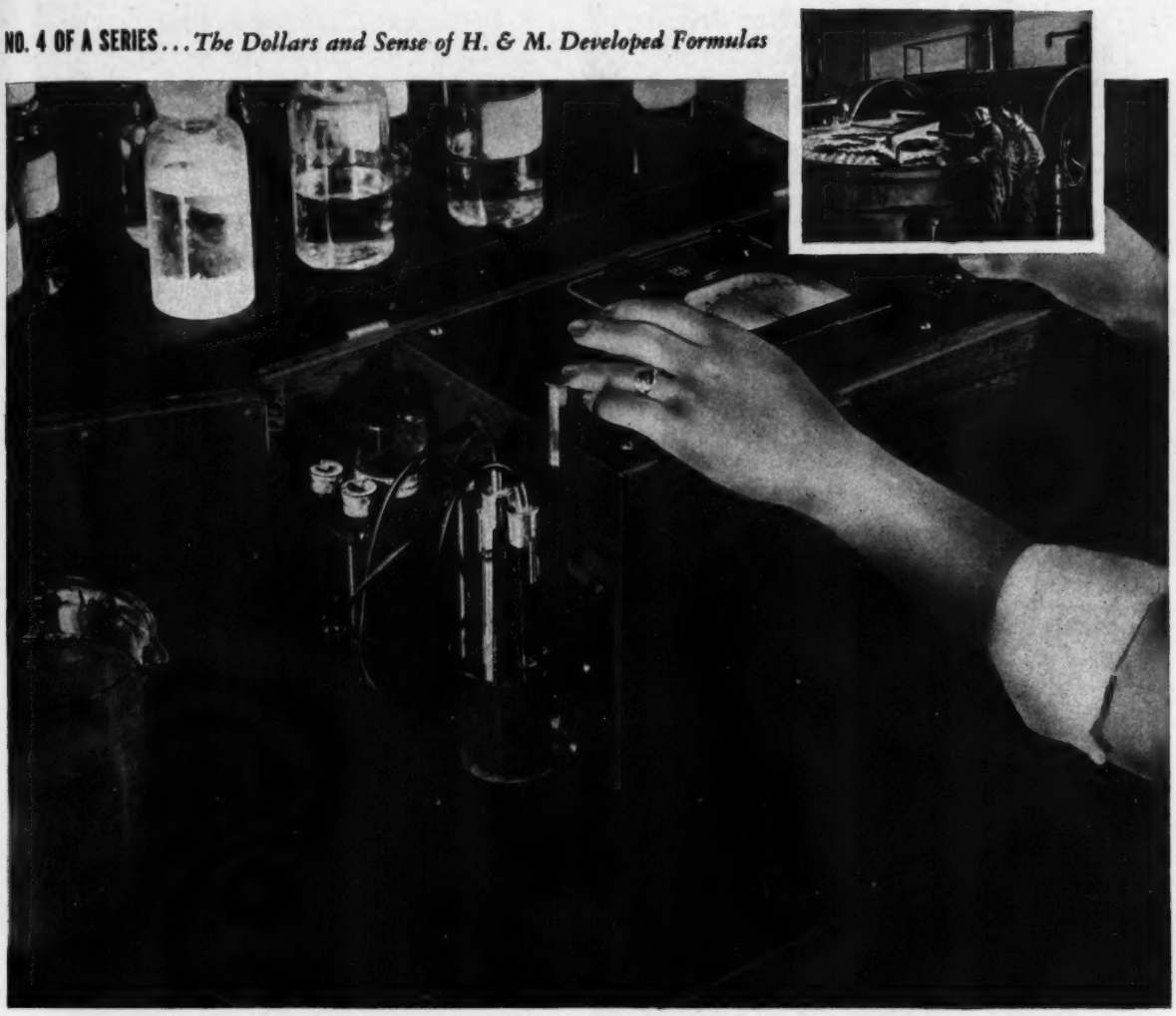
Michigan Superintendents Meet

KALAMAZOO, Mich., July 17, 1943—The annual summer meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association was held at the Kalamazoo Country Club on the afternoon and evening of July 16, 1943. Wartime restrictions made itself felt on the attendance, but the party was a great success.

The golf committee consisting of Jack Dicksen, chairman, Roy Holden and Al Sherwood, got the contestants teeing off at one o'clock and the nineteenth hole hospitality furnished by the committee, met with unanimous approval by the players. The club management served a fine dinner, buffet style, in the main dining room of the club house at 7:30. Following the meal Chairman Al Perlick opened the meeting and expressed his satisfaction and thanks to the different committees for their work and cooperation in making the occasion a success. Communications read from those unable to attend were as follows: J. Hoolihan, "Bob" Eminger, national secretary; A. J. Halliday, Fred Kruppeur, and from Leavenworth, Kansas, where they are stationed, Captain L. L. "Buster" Griffith and Major "Spike" Kelly.

Jack Dickson announced the winners of the Golf Tournament and awarded the prizes, which were books of War Saving Stamps. Art Woollam, first prize for Blind Bogey; Henry Kennedy, second for low gross; Glen Graham for low putts; Les Liberte for most number of sevens. Ray L. Barton, Michigan Division's national officer, was awarded the honor of presenting Robert F. "Sandy" Kohs with a life membership in the association commemorating the completion of fifty consecutive years in the paper industry. Mr. Kohs is superintendent of the Detroit Sulphite Pulp and Paper Company, having begun his association with the company in 1903 and has the record of being absent but 120 days during the fifty-year period. He responded to the honor conferred upon him with a few well chosen remarks. It was announced that annual election of officers is to take place in September.

NO. 4 OF A SERIES... *The Dollars and Sense of H. & M. Developed Formulas*



DETAILS THAT SAVE YOU DOLLARS!

WHEN H. & M. Technical Service develops a color formula there is so much more to the operation than the mere adding of color to the furnish until the desired shade is obtained.

Color may be the most important ingredient, but its effectiveness is measured by its compatability with other constituents. Size, alum, fillers, waxes, resins—all of these react definitely on the color and the pH must be controlled to have uniform results.

Obviously then, it is desirable that the development of a color formula be done in a laboratory where each factor affecting the final result may be kept under scientific control. For attention to these details, you cannot select a more skilled group of technicians than that which operates the H. & M. Technical Service Laboratories.

HELLER & MERZ DEPARTMENT

CALCO CHEMICAL DIVISION • AMERICAN CYANAMID COMPANY

BOUND BROOK, NEW JERSEY

Paper Supply Situation Not Bright

Based upon information available to the American Paper and Pulp Association, the 1944 paper supply outlook is indeed gloomy. Pulpwood consumption during the first five months of 1943 was equal to 6,250,000 cords. During the same period receipts of pulpwood amounted to 5,465,000 cords, a five months' drain on inventories of 785,000 cords, with rapidly declining receipts. Such a situation without remedial action can only result in cumulative shortages of paper.

During the year 1942, 16,700,000 cords of pulp wood were received by the paper industry. It is estimated that receipts for 1943 will be between thirteen and fourteen million cords.

By 1944 inventories of pulpwood will probably be so reduced as to prohibit further withdrawals. With estimated receipts of pulp wood in 1944 approximating 13,000,000 cords, production of only thirteen or fourteen millions of tons of paper and paperboard seems probable unless greatly increased quantities of other fibrous materials become available. This can be contrasted with current apparent demands at an annual rate of between 17 and 18 million tons. Unfilled orders in the industry by the end of the year will approximate one and a half million tons.

More production of paper is limited by the provisions of Order M-241. This order will have little future effect because pulpwood supplies will in the future so limit pulp production that paper production will automatically be controlled. While the situation presents a particularly dark outlook for the consuming public, it also presents a bad picture for the producing industry and particularly for mills dependent upon purchased pulp. The effect upon the large number of communities in New England, New York State and the North Central States, totally dependent upon paper mills for their existence, will be very great. For the Nation as a whole the situation could be relieved if the great market pulp mills were permitted to operate at capacity through the allocation of logs, particularly as these mills produce over 50% of the available market pulp. What is needed is the production of an additional three to four million cords of wood which nationally would require approximately 20,000 woods laborers, a truly insignificant number compared with the disastrous results that will otherwise be inevitable.

Paper Calenders and Calender Rolls

The Farrel-Birmingham Company, Inc., Ansonia, Conn., has issued a new booklet which will be of interest and use to superintendents, maintenance men, roll grinder operators and others who are responsible for the care and maintenance of rolls and calenders in the paper mill.

The booklet, entitled "A Practical Guide to Care of Calenders and Calender Rolls," discusses the common causes of roll trouble and gives many helpful hints on roll maintenance and grinding procedure. Instructions for lubrication of calenders and grinders are also included.

The publication of this booklet is a timely service to the paper industry as it will be of assistance in making rolls and calenders last through the present period when replacements are limited because of wartime restrictions. Copies can be obtained upon request to Farrel-Birmingham Company, Inc., Ansonia, Conn.

Personnel Changes at Brunswick

BRUNSWICK, Ga., July 16, 1943—E. J. Gaynor, 3rd, vice president and general manager of Brunswick Pulp and Paper Company, announced that A. J. Schroder, 2nd, who has been personnel manager of the local pulp mill since June, 1940, has been recalled by Scott Paper Company to become personnel director of that company. He will replace D. D. Wilkinson, who has been moved to Marinette, Wisconsin, as plant manager of the Scott subsidiary paper mill at that location.

In his new assignment Mr. Schroder's responsibility will not only cover the principal Scott plant, located at Chester, Pa., but will extend to the company's various branch plants located throughout the country.

Before coming to Brunswick, Mr. Schroder was associated with the Scott Paper Company, which with the Mead Corporation is a joint owner of the local mill. In his three years of local residence Mr. Schroder has participated in a wide range of community activities and has made many friends throughout this area.

Mr. Gaynor also announced that Harry S. Rossiter, presently associated with Scott Paper Company as plant personnel manager at Chester, will soon arrive to take over Mr. Schroder's duties here. Mr. Rossiter is a graduate of Duke University in the class of 1934 where he was an all-American football player and was a candidate for Rhodes Scholarship in 1933. Following his graduation from Duke he continued his athletic career by joining the coaching staff of the University of Pennsylvania football squad, an assignment which he carried on with considerable success for a number of years after returning to his home in Philadelphia. Mr. Rossiter has been associated with Scott Paper Company for eight years.

Behr-Manning Open Training School

[FROM OUR REGULAR CORRESPONDENT]

WATERVLIET, N. Y., July 19, 1943—The Behr-Manning Corporation has opened a training school for new workers in the old plant formerly occupied by the Earl & Wilson Company, in Troy. The course is to continue for five weeks with the prospective help receiving instructions in machine shop work. Another course to last three weeks is to open later this week with about ten men and women taking the training. The third course to instruct about ten men in electrical testing is scheduled to start next week.

The trainees taking all three courses will attend the classes eight hours a day for a total instruction of 48 hours a week and will be paid by the company during the training period. The school was established last year and is adequately equipped to carry out this program for any industrial concern needing new workers with specialized training.

The trainees must not be engaged at present in essential occupation and must not be subject to military service. In this first paid training program the company has referred the trainees to the school where they will be trained to the needs of the corporation.

It is also pointed out that the courses will not interfere in any way with the regular training at the school. Instructions in blue-print reading, shop mathematics and shop theory will also be given. George E. Holliday has been appointed supervisor of the school and has announced a revision of the schedule of classes in order to promote greater instruction efficiency.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending July 17, 1943

STOCKS

	High	Low	Last
A. P. W.	2½	2½	2½
Armstrong Cork Co.	39⅜	37¼	38¾
Celotex Corp.	14⅜	13⅞	14
Celotex Corp., pf.	21	19	20½
Certain-Teed Products Corp.	7	6⅝	6⅝
Certain-Teed Products Corp., pf.	59	53¾	58½
Champion Paper & Fibre Co.	24	23½	23½
Champion Paper & Fibre Co., pf.	107½	107	107½
Congoleum Nairn Co.	24⅝	24	24½
Container Corp. of America	23½	22⅝	22⅝
Continental-Diamond Fibre Co.	15⅛	14⅜	15
Crown-Zellerbach Co.	16¼	15½	16
Crown-Zellerbach Co., pf.	95	94⅛	95
Dixie Cup Co.	16⅜	15½	15⅜
Dixie Cup Co., —A.	45	44	44⅜
Flintkote Co.	21½	20¼	21⅜
Flintkote Co., pf.	108½	106	108½
Robert Gair	3½	3⅜	3½
Robert Gair, pf.	13½	13½	13½
International Paper Co.	13½	12½	12⅝
International Paper Co., pf.	62½	59½	61½
Johns-Manville Corp.	86¼	85¼	85¼
Johns-Manville Corp., pf.	132	132	132
Kimberly-Clark Corp.	34	32¼	34
MacAndrews & Forbes	27⅜	27	27
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	43¼	41¾	42⅞
Mead Corp.	9⅜	9⅛	9⅜
Mead Corp., pf. A-6%	86	85	85
Mead Corp., pf. B-5½%	76	75	76
Paraffine Companies, Inc.	43¾	43	43½
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	14⅞	14¼	14⅜
Rayonier, Inc., pf.	30⅛	29¾	29¾
Ruberoid Co.	27½	26	27⅜
Scott Paper Co.	42¼	41	42¾
Scott Paper Co., pf.	111	111	111
Sutherland Paper Co.	31¾	30¾	31¾
Union Bag & Paper Corp.	11	10¾	10¾
United Paperboard Co.	5⅜	5⅛	5⅛
U. S. Gypsum Co.	73½	71	73½
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	15⅜	15⅛	15⅛
West Virginia Pulp and Paper Co., pf.	107½	107½	107½

BONDS

Abitibi Pulp & Paper Co. 5s '53	67⅜	65⅛	67½
Celotex Corp. 4½s '47	102	101	101¾
Certain-Teed Products Corp. 5½s '48	100¼	99¾	100¼
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	107½	107	107
International Paper Co. 5s '47	104⅝	104½	104⅝
Mead Corp. 3¾s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	103½	103½	103½

New York Curb Exchange

High, Low and Last for Week Ending July 17, 1943

STOCKS

	High	Low	Last
American Box Board Co.	8¼	8	8
Brown Co., pf.	....	....	....
Great Northern Paper Co.	33¾	33⅜	33⅜
Hummel-Ross Fibre Corp.	5	4⅜	4⅜
National Container Corp.	13	11⅝	13
St. Regis Paper Co.	4⅛	3⅞	4⅛
St. Regis Paper Co., pf.	132¾	131½	132¾
Taggart Corp.	4½	4¼	4¼

BONDS

American Writing Paper Co. 6s '61	95	94⅛	94⅛

Celotex to Sell Bonds

Arrangements have been made by the Celotex Corporation for the sale of $3,000,000 of sinking fund 3¾% debentures due in 1955, and a registration statement has been filed with the Securities and Exchange Commission preparatory to an expected public offering within a few weeks.

Proceeds of the offering will be used to retire $3,158,000 of outstanding 4½% debentures.

After the sale of the debentures, 70,226 shares of common stock will be offered to present stockholders on the basis of one share for each ten shares held, at a discount from the prevailing market price.

Brown Co. Earnings Cut

The Brown Company, Berlin, N. H., and its Canadian subsidiary, Brown Corporation, manufacturers of pulps, paper, towels, conduit, and other products, report unaudited consolidated net income of $674,730, after taxes and all other charges, for the 28 weeks ended June 12, 1943, as compared with $1,377,715 for the corresponding period of last year. For the same period, net income before taxes in 1943 was $1,593,230 as against $3,146,915 in 1942 and income taxes for the respective periods were $918,500 and $1,769,200.

The decrease in 1943 was principally in the earnings of Brown Company, the United States parent company, and was the result of an inadequate supply of wood due to shortage of men for woods operations, and of higher costs for pulpwood and labor. As previously announced, because of inadequate wood supply the pulp section of the Cascade mill, the Company's smaller pulp producing unit in the United States, has recently been shut down and pulp production concentrated at the larger mill. Present pulp production is running at approximately 79% of the previous operating rate in Berlin and at full capacity at La Tuque, Canada.

The paper mills at Berlin are presently running at full normal capacity.

Paper Mill Inventories Lower

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 21, 1943—May index of the value of paper mill inventories was 136.1 compared with 138.6 in April and 145.9 in May of last year taking an average month of 1939 at 100 according to the monthly industry survey of the Department of Commerce.

Index of the value of paper mill shipments in May was 159 compared with 159 in April and 154 in May of last year also taking an average month of 1939 at 100.

Bartgis Profits Off

Bartgis Brothers Company for 1942, reports a net income of $50,762, equal, after preferred dividend requirements, to 37 cents each on 108,052 common shares, against $121,588, or $1.02 a common share the year before.

Columbia River Earns $10.04

The Columbia River Paper Mills for 1942 report a net profit of $206,934, equal to $10.04 a share on 20,000 shares of common stock, compared with $340,449, or $16.67 a share, in 1941.

Oregon Pulp Nets $21.19

The Oregon Pulp and Paper Company for 1942 reports a net profit of $279,691, equal to $21.19 a share on 12,966 shares of common stock, compared with $370,368, or $28.16 a share, in 1941.

Issue New Pulpwood Ceilings

WASHINGTON, D. C., July 21, 1943—Dollars-and-cents ceilings on pulpwood produced in North Carolina and that portion of Virginia west of the counties of Craig, Montgomery, Floyd and Patrick were established by the Office of Price Administration today.

These spelled-out ceilings replace maximum prices that were frozen for this area on March 5, 1943, at each seller's highest prices during the five-day period, February 27 to March 4, 1943, inclusive.

No material change in prices will result from today's action as the dollars-and-cents ceilings, in general, continue the levels in effect during the five-day "freeze" period.

The new ceilings for pulpwood, per cord, f.o.b., cars are as follows: Rough Pine, $7.10 to $7.60; Rough Southern Hardwood, $7.60 to $8.10.

In another move in its program of establishing dollars-and-cents ceilings for pulpwood by areas, the Office of Price Administration today announced specific maximum prices for pulpwood produced in eastern Virginia.

Eastern Virginia includes all of Virginia east of the Counties of Giles, Pulaski and Carroll in that state.

Pulpwood ceilings in this area have been frozen since March 5, 1943, at each seller's highest prices during the five-day period, February 27 to March 4, 1943, inclusive.

The specific ceilings established today perpetuate, in general, the levels which prevailed during this five-day period. Hence, no material change results from today's action as compared with maximum prices observed in recent months.

The new ceilings for pulpwood in eastern Virginia, per cord, are as follows: Pine, rough, $80; peeled, $11.60. Green wood, rough, $8.50; peeled, $12.10. Other Hardwoods, rough, $8; peeled, $11.60.

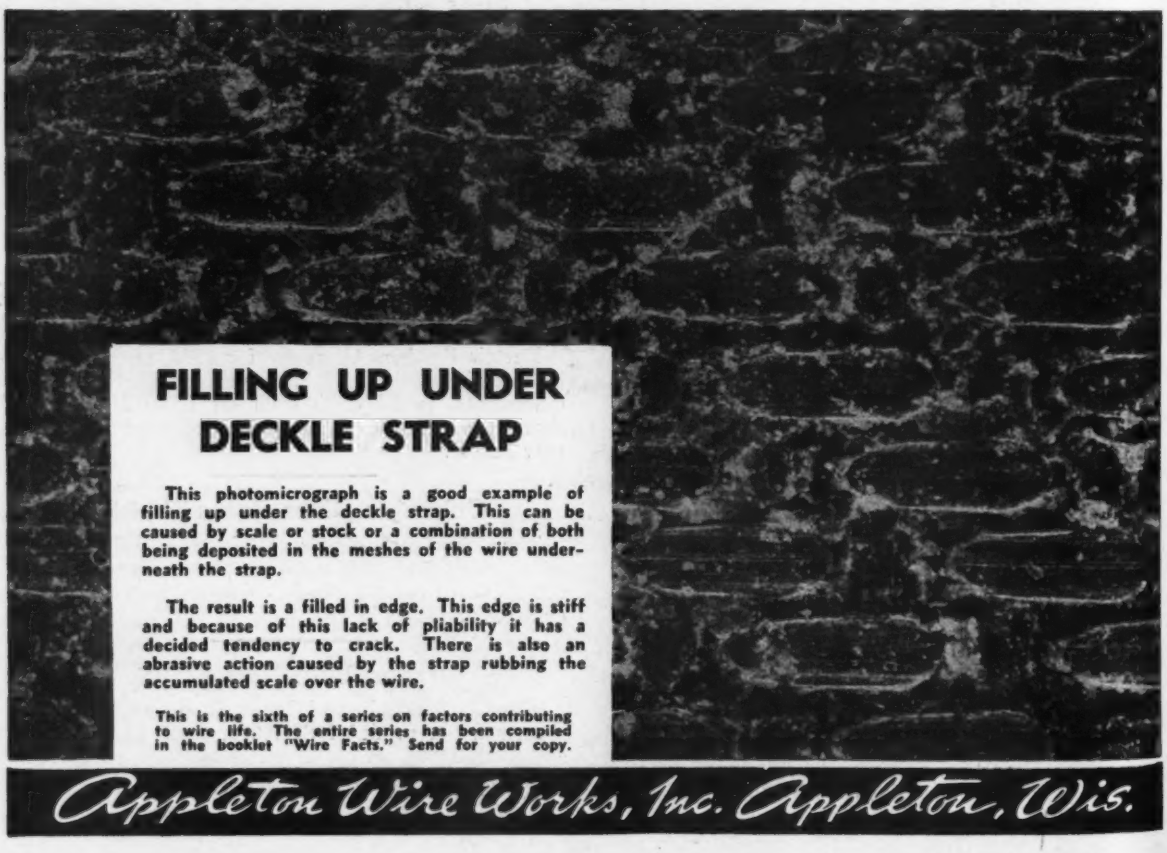
Price differentials for peeling and allowances to cover special loading costs are allowed.

June Newsprint Statistics

Production of newsprint in Canada during June, 1943, amounted to 257,845 tons and shipments to 268,990 tons, according to the News Print Service. Production in the United States was 70,274 tons and shipments 71,944 tons, making a total United States and Canadian news print production of 328,119 tons and shipments of 340,934 tons. During June, 20,538 tons of news print were made in Newfoundland, so that the North American production for the month amounted to 348,657 tons. Total production in June 1942 was 342,493 tons.

The Canadian mills produced 214,504 tons less in the first six months of 1943 than in the first six months of 1942, which was a decrease of twelve and nine-tenths percent. The output in the United States was 71,391 tons or fourteen and eight-tenths percent less than in the first six months of 1942, in Newfoundland production was 62,173 tons or forty percent less, making a total decrease of 348,068 tons, or fifteen and two-tenths percent less than in the first six months of 1942.

Stocks of news print paper at the end of June were 79,229 tons at Canadian mills and 10,978 tons at United States mills, making a combined total of 90,207 tons compared with 103,022 tons on May 31, 1943, and 175,937 tons at the end of June 1942.


FILLING UP UNDER DECKLE STRAP
This photomicrograph is a good example of filling up under the deckle strap. This can be caused by scale or stock or a combination of both being deposited in the meshes of the wire underneath the strap.
The result is a filled in edge. This edge is stiff and because of this lack of pliability it has a decided tendency to crack. There is also an abrasive action caused by the strap rubbing the accumulated scale over the wire.
This is the sixth of a series on factors contributing to wire life. The entire series has been compiled in the booklet "Wire Facts." Send for your copy.
Appleton Wire Works, Inc. Appleton, Wis.

Army-Navy "E" Awarded To Niagara Alkali

In recognition of "high achievement in producing materials needed for war," the Niagara Alkali Company received the Army-Navy "E" pennant in impressive ceremonies at the company plant at Niagara Falls recently.

"The Army-Navy 'E' will serve as an inspiration to apply ourselves with ever-increasing diligence that we may continue to produce to the full limit the products of our manufacture that serve in so many fields to the advancement of the war effort," said J. Clarke Cassidy, president of the company, who presided at the ceremonies. "The 'E' will also serve to inspire our research to the achievement of even more important developments than those accomplished to date."

When he accepted the "E" pennant, S. Willard Jacobs, vice-president of the company, said in part, "The job that we have done is the result of good teamwork by all of the employees of the company. . . . The flag is both an honor, and a challege: an honor for past performance; a challene to do still better. . . ."

There are many "firsts" to be credited to the Niagara Alkali Company. In 1907 it set up the first facilities for the manufacture of liquid chlorine in the United States. It was the first company to produce caustic potash in this country; first to produce flake caustic soda here; first American producer of carbonate of potash. And now Niagara Alkali is proud to be among those companies which are first in producing materials for Victory.

Sirrine Gets First Honors

The current advertising campaign of the J. E. Sirrine & Co., Greenville, S. C., consulting, designing and supervising engineers and architects, was awarded first honors in two classifications in the annual advertising competition of the National Advertising Agency Network at its recent war conference in New York.

The Sirrine Campaign which was "headlined" by quotations from Shakespeare and which appeared in general and trade magazines during the past year was judged best General Magazine Advertising entry and also best in the art, illustration and typography division.

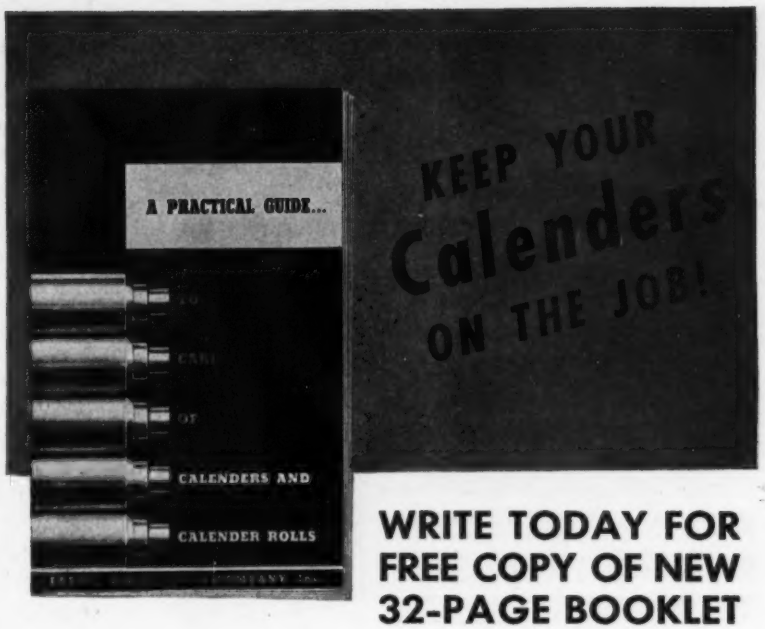
Promoting the prosecution of the war was the central theme of the series, each advertisement taking up a special phase of the home front effort.

The titles or headlines of the advertisements were all quotations from Shakespeare and fitted into today's conditions as if they had been written to order.

The versatile role of the Engineer against the background of war tied into each advertisement.

The National Advertising Agency Network Competition was the largest in its history. The winning awards in all classifications will be sent on a coast-to-coast tour and will be exhibited in 28 other cities. These will include Seattle, San Francisco, Los Angeles, Tulsa, St. Louis, Kansas City, Des Moines, Milwaukee, Chicago, Detroit, Cleveland, Cincinnati, Syracuse, Boston, Hartford, Philadelphia, Baltimore and Washington.

The Philadelphia Network Agency member Roland G. E. Ullman, president of the Roland G. E. Ullman Organization and account executive handling the J. E. Sirrine & Co. account for the past 24 years, accepted the award for transmission to Mr. J. E. Sirrine.



WRITE TODAY FOR FREE COPY OF NEW 32-PAGE BOOKLET

Here's a booklet that will help you avoid calender failure. It discusses the common causes of roll trouble and gives many helpful hints on roll maintenance and grinding procedure. Instructions for lubrication of calenders and grinders are included. Contains no advertising.

FARREL-BIRMINGHAM CO., Inc.
ANSONIA, CONN. - Dept. 11A

Please send me a copy of your new booklet on the care of calenders and calender rolls.

Name.....

Title.....

Company.....

Address.....

City..... State.....

FOR MEN WHO WANT THEIR CALENDERS TO OUTLAST HITLER

Superintendents, maintenance men and roll grinder operators will find this booklet useful. To obtain a copy simply fill out the coupon and mail it. There is no charge and no obligation.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 117 July 22, 1943 No. 4

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Palmer House, Chicago, September 21-24, 1943.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

WAGE INCENTIVES

American industry has established a remarkable record of production. The over-all war program set early this year amounted to $106 billion, or 80% more than the $59 billion total for 1942. In the words of Donald M. Nelson, chairman of the War Production Board, "Today we are turning out nearly as much material for war, measured in dollar value, as we ever produced for our peace-time needs, and we have enough industrial power left over to keep civilian standards of living at a level higher than many of us dared hoped for. I am personally confident that in the months ahead the productive record of American labor, management, agriculture and government, working together, will fully meet the demands of the armed forces in pressing home the attacks on every front."

In this great achievement of production and in the progress now being made to increase it fully 50%, the wage incentive motive is a prime factor that must be satisfactorily settled to the satisfaction of the worker. In a report (No. 141), on Wage Incentives for More Production, issued by the George S. May Business Foundation, South Dearborn street, Chicago, Ill., this important phase of production is discussed in some detail. The report points out that the basic idea of wage incentives is as old as mankind. Frederick Winslow Taylor, known as the founder of scientific industrial management, gave new meaning to the idea nearly fifty years ago, when he showed American industry how to increase production and reduce total unit costs while paying higher wages to labor. Mr. Taylor, says the report, proceeded on the rational assumption that "man will not do an extraordinary day's work for an ordinary day's pay. . . . Many manufacturers, in considering the cost of production, fail to realize the effect that the volume has on cost. They lose sight of the fact that taxes, insurance, depreciation, rent, interest, salaries, office expenses, miscellaneous labor, sales expenses, and frequently the cost of power . . . remain the same whether the output of the establishment is great or small."

In discussing how volume affects profits, the report states in part that, "Until recent years, many engineers and cost accountants considered only the direct labor savings resulting from increased production. The employer often retained a portion of such savings. This kind of thinking is rapidly becoming obsolete. As Taylor pointed out, direct labor costs are not as important as unit costs. When the additional profit on each extra unit of production is properly evaluated, it usually exceeds the direct savings in labor. With increased production, larger profits may be earned despite higher wages . . . Unfortunately, some of Taylor's contemporaries and many of those who followed, overlooked the vital principle in their enthusiasm over his piece rate plan. A great crop of 'efficiency experts,' with numerous wage plans and systems, came into being, and sometimes repeated the errors committed during the earlier European experiments. Nowadays, certain broad principles rather than precise formulae govern the application of wage incentives. Base rates, when determined by external forces, need not be changed. Experience indicates incentives may be built into almost any practical wage payment plan by setting the correct performance standards. Before attempting to establish performance standards, the following preliminary steps should be taken: (1) Review of Production Controls, (2) Job Standardization, and (3) Job Evaluation."

In reference to production standards, the report points out that, "To insure steady operation at all work centers, a thorough study should be made of all phases of planning and production . . In job standardization, performance standards . . . are set up for each job. Wage incentives, in the form of increased compensation, accrue when a worker's production exceeds the standard thus established . . . Jobs are analyzed and evaluated according to their relative importance within an organization. Job evaluation is entirely impersonal, and should not be confused with man rating or individual merit rating, which may and frequently does follow . . . Without job standardization and job evaluation, a wage payment plan provides only a basis for calculating earnings. Wage incentives are created when the correct rate is set for fair performance standards."

The report briefly summarizes the various wage incentive plans in successful use, in part as follows: "The time or day rates plan is probably the most widely used. The worker is compensated for his time, but offers the worker no direct incentive. The Halsey Premium Plan, introduced about 1890 by Frederick A. Halsey, a distinguished engineer, provides a guaranteed time wage. Tasks or performance standards

are set, based upon experience or estimates. Time is shared by employer and worker. Worker's share of the saving, ranging from 50 to 85%, offers a fair incentive . . . The Rowan Variable Sharing Plan, introduced in 1898 by James Rowan of Glasgow, Scotland, guarantees a time wage. The task or standard is usually based upon experience or past performance. Roughly, for every 10% that is saved on the time allowed, the worker receives a 10% increase in earnings . . . The origin of the job or peace rate method is obscure. Ancient craftsmen were paid by the job . . . The Straight Piece Rate, or a constant rate of pay unit of work, has not been popular with workers in modern times . . . The Taylor Differential Piece Rate Plan, introduced in 1895 by F. W. Taylor, sets tasks within the capacity of competent workers and arranges working conditions so that such workers could accomplish their tasks. This plan did not become widely popular and it was abandoned in favor of the Gnatt Task and Bonus Plan. This retained the differential principle without the punitive feature. A daily wage is guaranteed. Instead of piece rate, it pays on the basis of standard time. A liberal bonus encourages the worker to complete his task within the standard time." The report concludes with the statement that, "In the hands of capable, alert management, a soundly conceived incentive system should become an invaluable tool for controlling production, quality and profits."

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1943		Corresponding Weeks—1942	
June 5 (Includes Memorial Day)	85.1	June 6	90.2
June 12	88.3	June 13	88.4
June 19	87.5	June 20	86.5
June 26	88.1	June 27	84.5
July 3 (Revised)	85.6	July 4	67.6
July 10 (Holiday Week)	*67.1*	July 11	69.7

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8
1943	87.2	88.9	89.5	88.7	91.5	*85.8*	

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1942	80.8	82.8	90.6	86.9	80.1	90.4
1943	....	....	....	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1936	1937	1938	1939	1940	1941	1942	1943
Year to Date..	77.6	88.1	67.1	78.6	86.6	92.8	96.8	*88.1*
Year Average..	80.4	79.8	71.5	83.4	85.6	97.4	90.4	....

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Ave.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	72	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	*94*							

Week ending June 5, 1943—92
Week ending June 12, 1943—97
Week ending June 19, 1943—95
Week ending June 26, 1943—96
Week ending July 3, 1943—92
Week ending July 10, 1943—69

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

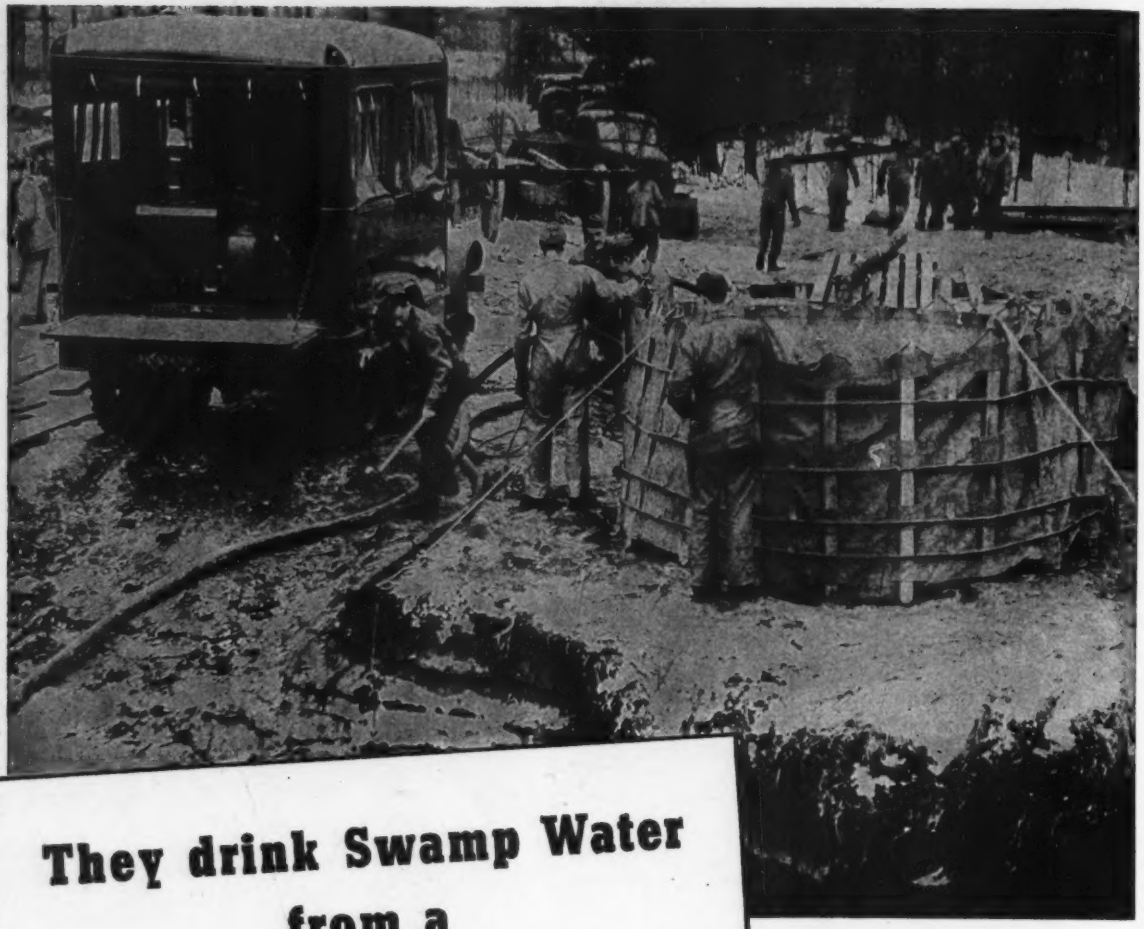
There can be no quality paper without quality wire
"The diagram at the left indicates the actual position of the wire in the box. It is made to assist you in placing the wire on the machine."
TOP SHOULD RUN THUS
1
2
3

Yes, we want our "package" to impress you favorably. Every box is kept newly painted. That will look well, of course. More than that, a fresh coat of paint helps waterproof the lumber. Our steel winding cores are coated with high grade lacquer. That looks well, too, but, more than that, it keeps rust and grease from injuring the wire. Thus every Lindsay wire travels in a strong, dry box, amply protected from untoward experiences . . . With every wire is enclosed a diagram like the one above to assist you in placing the wire on your machine. The diagram above is one of many which show how to unroll different types of wires. We believe that the precautions we take and those we suggest to you will aid you in securing better results from your purchases of Lindsay wire cloth.

THE LINDSAY WIRE WEAVING COMPANY

Serving the Paper Industry Since 1903

14001-14299 ASPINWALL AVE. • CLEVELAND, OHIO



They drink Swamp Water from a Stainless "Waterworks"

Our soldiers can drink swamp water in perfect safety — thanks to this purifier, which supplies enough water for 5000 men. Many of these "waterworks on wheels" have been made of ARMCO *Stainless Steel, the same smooth, rustless metal that paper mill men prefer for flow boxes, stuff chests, and other important equipment.*

Providing clean, pure water for thirsty troops is no cinch. But Army engineers and Yankee industry licked the problem in a way that paper mill men would approve.

They designed the "waterworks on wheels," a sturdy, truck-mounted purification unit that takes care of the daily water needs of five thousand men. Three units supply water for an entire division.

Obviously the metal had to be smooth, rustless, sanitary; easily kept clean in disease-ridden swamp or jungle; "tough" enough not to need babying by hard-working, hard-fighting soldiers. It was a job for stainless steel, the same metal that has helped defeat slime and rust in Fourdriniers and other vital equipment.

This is just one of many rough-and-tough war jobs where ARMCO Stainless is serving staunchly. When peace comes you'll find it an equally good "soldier" in your never-ceasing production battles. Keep that in mind when you draw up your post-war equipment plans. The American Rolling Mill Co., 2181 Curtis St., Middletown, Ohio.

THE AMERICAN ROLLING MILL COMPANY

MADE OF ARMCO STAINLESS STEEL

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY

Edited by R. G. Macdonald, Secretary

TAPPI Army and Navy Conference

Official approval has been received from General Surles and Admiral Young to permit full participation by the Army and the Navy in the Army and Navy Paper Requirements Conference to be held at the Palmer House, Chicago, Ill., September 21-24, 1943.

This conference which is being sponsored by the Technical Association of the Pulp and Paper Industry is for the benefit of the Armed Forces and the entire paper, paperboard and converting industries.

A feature of the meeting will be a magnicent exhibit by the Army and Navy of 10,000 sq. ft. of displays showing the uses of paper. Technically expert officers of both branches will be on hand to discuss the products shown.

The first day of the meeting (September 21), will be devoted to the presentation of the existing paper requirements problems by Army and Navy officers and representatives of other Government Agencies. Throughout the four day meeting, these and other officers will be on hand to permit personal interviews.

On the second day (September 22), the staff of the Ordnance Packing Staff of the Forest Products Laboratory will give the lectures that have already been given to hundreds of Ordnance contractors of the Army and the Navy. These lectures will feature proper container construction, testing, etc.

In the afternoon of September 22, there will be an important conference on water vapor permeability. This will be based on some very important work now going on within the Technical Association, and should clear up many of the present problems relating to this subject. The water vapor permeability test is one of the most important criteria indicating how well packaging material will stand up in export shipment to the Far East and the Mediterranean. The test is being used at present with good success but requires considerable refinement, based on current research to enable it to attain the high specifications required of the official standards of the Technical Association of the Pulp and Paper Industry.

Case studies showing conversion to paper from other materials will be presented by representatives of various consumer goods industries such as meat packing, chemicals, and electrical products.

The sessions of Thursday, September 23, will be devoted to technical papers on several important subjects. These will be announced at a later date.

It is to be noted that this is to be a TAPPI sponsored meeting rather than the usual TAPPI Fall Meeting. It has been felt that the wartime responsibilities of such a meeting as this should not be restricted to any single Association. It has been recommended that all trade associations meet during the week of September 20 to see the Army and Navy Exhibits, and to assist the officers present in learning more about the technical resourcefulness of the industry.

There will be no effort made to promote a large attendance. Attendance at recent TAPPI meetings have been record breaking, but it is very desirable that only companies who have definitely high grade technical men and operators qualified to advise the Armed Services officers be in attendance. There will be very little attention given to the social aspects of a fall meeting. It is a meeting that is being organized to give the industry a real opportunity to make a contribution toward winning the War as soon as possible.

Reservations for rooms should be made directly with the Palmer House. Mention should be made of the TAPPI meeting to assure attention.

Chemistry of Large Molecules

In this day of intensive specialization the broad aspects of science are frequently neglected. An endeavor to supply this information is presented in "The Chemistry of Large Molecules" (Frontiers in Chemistry, Volume 1), edited by R. E. Burk and Oliver Grummitt and published by Interscience Publishers, Inc., 215 Fourth avenue, New York, at $3.50 a copy.

The contents indicate the wide field of discussion of these lectures by experts. H. Mark, of the Polytechnic Institute of Brooklyn, N. Y., covers The Mechanism of Polyreactions and the Investigation of High Polymers with X-rays.

The Colloidal Behavior of Organic Macromolecular Materials is presented by E. P. Kraemer, of the Franklin Institute, Newark, Del. He also contributes a lecture on The Ultracentrifuge and its Application to the Study of Organic Macromolecules.

The subject of Elastic-Viscous Properties of Matter is discussed by Arthur Eyring of Princeton University. Other lectures include the Electrical Properties of High Polymers, by Raymond M. Fuoss of the General Electric Company; The Organic Chemistry of Vinyl Polymers, by C. S. Marvel of the University of Illinois; and The Chemistry of Cellulose and Cellulose Derivatives, by Emil Ott, of the Hercules Powder Company.

Paper Box Orders Drop

CHICAGO, Ill., July 12, 1943—Orders for folding paper boxes in June fell 20.6 per cent below the May volume but showed an increase of 37.1 per cent above June last year, the Folding Paper Box Association reported last week.

Tall Oil for the War Effort*

By J. M. Wafer[1], A. Pollak[2], and R. Hastings[3]

Abstract

Of the 100,000 tons of tall oil estimated available annually in the United States between one third and one half is now being recovered as crude tall oil skimmings or as crude tall oil. Of 46 possible sources 16 are now reclaiming skimmings and of these 8 convert to crude tall oil. To conserve this waste, the prevailing scarcity of materials, of technical personnel, and of general know-how suggests that, while the collection of crude tall oil skimmings could be begun promptly at nearly all sources, the construction of many crude tall oil plants at this time is inadvisable. Preferable would be expansions in the capacities of existing crude tall oil plants so that they may convert all the skimmings in their regions. The utilization, variations in yields, and composition of tall oils are discussed.

Every day as we meet here and until we actually begin its collection, about 150 tons of tall oil is being wasted despite the growing shortage of fats and oils and in the face of serious efforts by the War Production Board to minimize such wastes. But today our right to preserve an amiable lethargy must be re-examined and even if a few reasoned excuses may be found, it is still unpardonable for any of us to tolerate this waste if by a cooperative effort it can be eliminated.

There isn't steel enough to provide tall oil plants for every pulp mill, nor operators to man them. There certainly isn't enough technical and commercial know-how to enable all of us to swing into the full production needed now. But we believe that enough material and know-how can be assembled if we all share the task by a united effort. If we plan wisely we can soon begin to recover the available tall oil and our effort may even prove profitable, at least for the duration.

The War Production Board is already well aware of our continued waste of a national resource and while, after sufficient study, the Fats and Oils Section could muster an equitable plan, how much better if through our TAPPI we could formulate and activate a plan of our own. Surely we could get results more quickly.

As the largest producers of tall oil we have, naturally enough, devoted some time to the study of the production and marketing of tall oil and its products. This paper presents some of the facts and conjectures which we hope will stimulate members of TAPPI to evolve a rational plan for conserving the supply of all tall oil as one of their contributions to the war effort.

Tall Oil from Pine Wood

For those who are not familiar with tall oil it might be explained that in the soda and sulphate processes for pulping pine wood, the fatty and rosin acids in the sap dissolve in the cooking liquor as the sodium soaps. When the resulting black liquor is evaporated, prior to burning, these soaps salt out much as does ordinary soap in a soap kettle. This soap can be separated from the black liquor and the separated pasty, sometimes frothy, mass constitutes the commodity known as *crude tall oil skimmings*. This material has found only a very limited use because of its high bulk and its high content of water which make it costly to ship for long distances. The presence of appreciable amounts of impurities, especially occluded black liquor further increase shipping costs. When these skimmings are acidulated, a dark brown oil can be separated in approximately 50% yield and this is known as *crude tall oil*. Being relatively free of water and impurities, and of less bulk, a much wider utilization has developed. Crude tall oil can be refined by various processes to yield material of improved qualities and other tall oil products, as will be reviewed later in this paper.

The term *tall oil* has become generally accepted in this country, being now used in the patent art, the periodical literature, freight classifications, and elsewhere, but in older references tall oil is designated as "liquid rosin." Tall oil is sometimes confused with rosin oil and with pine oil, but bears no similarity to these.

A considerable literature has developed on the chemistry and applications of tall oil. Over 500 references in the patent and periodical literature have been noted and several more or less complete bibliographies have been prepared *(1-3)*.

What Do We Know About Tall Oil?

Despite this apparent wealth of information on tall oil, curiously enough, we lack most of the vital facts that would enable us to formulate a wise plan for its reclamation. Let us first review the relevant information that is available and so discover what we lack. For a reasonable plan keyed to the war effort we ought to have the following categories of facts on tall oil: (1) where it is, (2) how much there is, (3) how to recover it, (4) where it can be applied to relieve fat shortages, (5) how to get it there.

Sources of Tall Oil

Since tall oil originates at pulp mills operating soda and sulphate processes and using pine wood, we might begin by looking them up in a directory (4) and compiling a list of them. For convenience we list such mills in Table I and further, in Fig. 1, show by a map the relative locations of mills which are possible sources of tall oil skimmings as well as mills where tall oil is already being produced.

It will be seen that there are 8 producers of tall oil and that these are fairly well distributed among the 46 possible sources of tall oil. In addition to the 8 producers of tall oil, there are probably 8 other mills selling some of their crude tall oil skimmings. Also to be noted is that most of the sources for tall oil are

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

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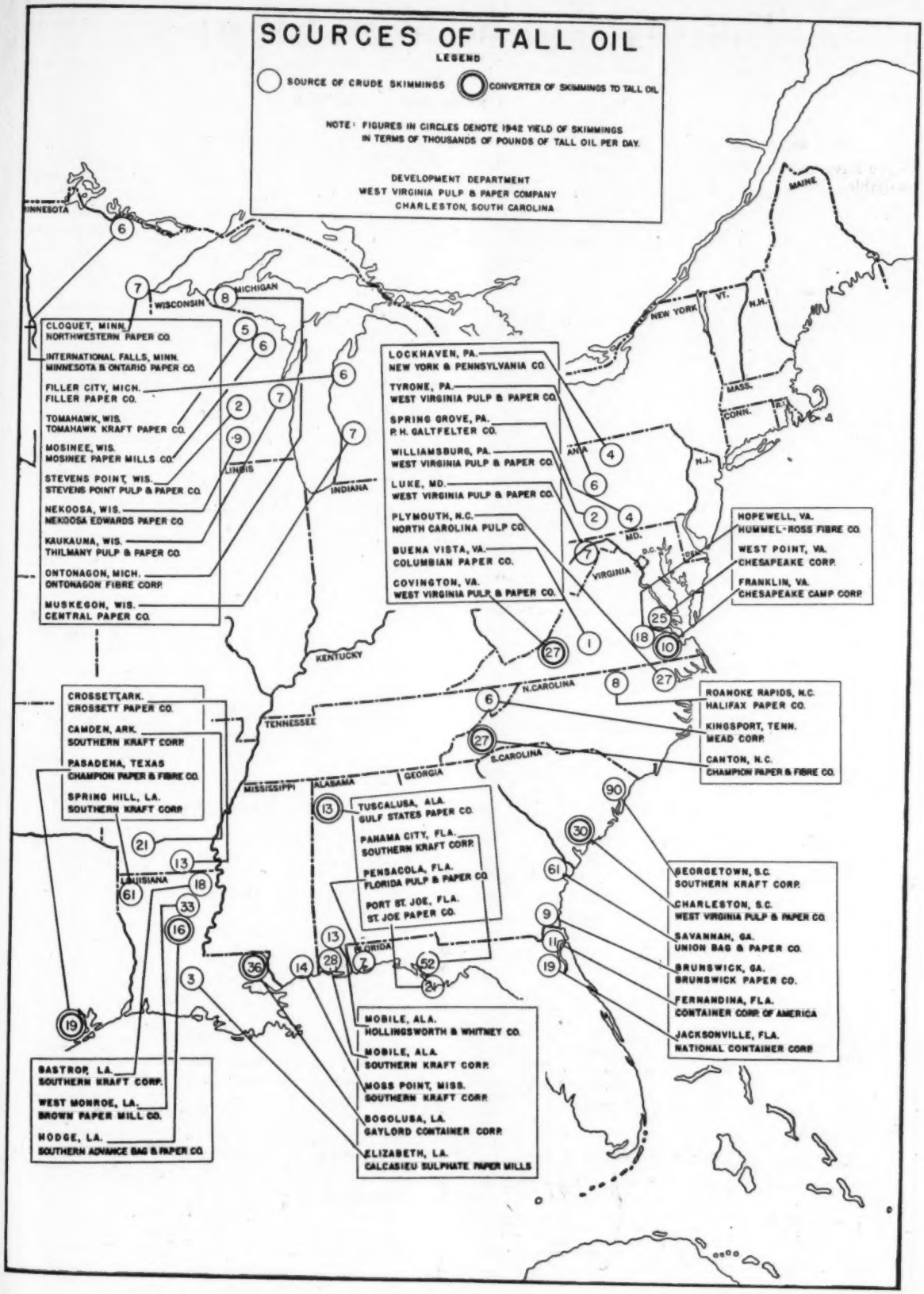
SOURCES OF TALL OIL
LEGEND
SOURCE OF CRUDE SKIMMINGS
CONVERTER OF SKIMMINGS TO TALL OIL
NOTE: FIGURES IN CIRCLES DENOTE 1942 YIELD OF SKIMMINGS IN TERMS OF THOUSANDS OF POUNDS OF TALL OIL PER DAY.
DEVELOPMENT DEPARTMENT
WEST VIRGINIA PULP & PAPER COMPANY
CHARLESTON, SOUTH CAROLINA
CLOQUET, MINN. NORTHWESTERN PAPER CO.
INTERNATIONAL FALLS, MINN. MINNESOTA & ONTARIO PAPER CO.
FILLER CITY, MICH. FILLER PAPER CO.
TOMAHAWK, WIS. TOMAHAWK KRAFT PAPER CO.
MOSINEE, WIS. MOSINEE PAPER MILLS CO.
STEVENS POINT, WIS. STEVENS POINT PULP & PAPER CO.
NEKOOSA, WIS. NEKOOSA EDWARDS PAPER CO.
KAUKAUNA, WIS. THILMANY PULP & PAPER CO.
ONTONAGON, MICH. ONTONAGON FIBRE CORP.
MUSKEGON, WIS. CENTRAL PAPER CO.
LOCKHAVEN, PA. NEW YORK & PENNSYLVANIA CO.
TYRONE, PA. WEST VIRGINIA PULP & PAPER CO.
SPRING GROVE, PA. P. H. GALTFELTER CO.
WILLIAMSBURG, PA. WEST VIRGINIA PULP & PAPER CO.
LUKE, MD. WEST VIRGINIA PULP & PAPER CO.
PLYMOUTH, N.C. NORTH CAROLINA PULP CO.
BUENA VISTA, VA. COLUMBIAN PAPER CO.
COVINGTON, VA. WEST VIRGINIA PULP & PAPER CO.
HOPEWELL, VA. HUMMEL-ROSS FIBRE CO.
WEST POINT, VA. CHESAPEAKE CORP.
FRANKLIN, VA. CHESAPEAKE CAMP CORP.
CROSSETT, ARK. CROSSETT PAPER CO.
CAMDEN, ARK. SOUTHERN KRAFT CORP.
PASADENA, TEXAS CHAMPION PAPER & FIBRE CO.
SPRING HILL, LA. SOUTHERN KRAFT CORP.
ROANOKE RAPIDS, N.C. HALIFAX PAPER CO.
KINGSPORT, TENN. MEAD CORP.
CANTON, N.C. CHAMPION PAPER & FIBRE CO.
TUSCALUSA, ALA. GULF STATES PAPER CO.
PANAMA CITY, FLA. SOUTHERN KRAFT CORP.
PENSACOLA, FLA. FLORIDA PULP & PAPER CO.
PORT ST. JOE, FLA. ST. JOE PAPER CO.
GEORGETOWN, S.C. SOUTHERN KRAFT CORP.
CHARLESTON, S.C. WEST VIRGINIA PULP & PAPER CO.
SAVANNAH, GA. UNION BAG & PAPER CO.
BRUNSWICK, GA. BRUNSWICK PAPER CO.
FERNANDINA, FLA. CONTAINER CORP. OF AMERICA
JACKSONVILLE, FLA. NATIONAL CONTAINER CORP.
MOBILE, ALA. HOLLINGSWORTH & WHITNEY CO.
MOBILE, ALA. SOUTHERN KRAFT CORP.
MOSS POINT, MISS. SOUTHERN KRAFT CORP.
BOGOLUSA, LA. GAYLORD CONTAINER CORP.
ELIZABETH, LA. CALCASIEU SULPHATE PAPER MILLS
BASTROP, LA. SOUTHERN KRAFT CORP.
WEST MONROE, LA. BROWN PAPER MILL CO.
HODGE, LA. SOUTHERN ADVANCE BAG & PAPER CO.
MINNESOTA
WISCONSIN
MICHIGAN
ILLINOIS
INDIANA
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
LOUISIANA
FLORIDA
S.CAROLINA
N.CAROLINA
VIRGINIA
MD.
D.C.
DEL.
N.J.
PENN.
NEW YORK
CONN.
R.I.
MASS.
VT.
N.H.
MAINE

FIG. 1

in the south and so considerable distances from the principal domestic consuming centers in the north.

It would therefore seem that skimmings should be converted to tall oil near the sources in order to minimize the freight cost as well as to conserve the supply of tank cars.

The Potential Supply of Tall Oil

We have estimated that 100,000 tons of tall oil is available annually. In the absence of better information this estimate was made by guessing that the industry would collect, on the average, 120 pounds of skimmings per ton of 90% moisture-free pine wood pulp and that of the 4.4 million tons of sulphate pulp produced in 1941, about 80% of this production would be in a position to collect tall oil skimmings.

Another estimate could be based on the average daily pulp producing capacity of the various soda and sulphate mills and this would indicate, assuming a yield of 60 pounds of tall oil per ton of pulp, that over 800,000 pounds of tall oil daily was recoverable in 1942.

Our guess of an average yield of 60 pounds of tall oil per ton of pine pulp was based on our experience, but this has not been a fair sample of the industry. We find the yield to be governed by so many circumstances that each mill must really be considered separately. Among the important factors we have found to affect the yield are: (1) the amount of nonpine chips cooked together with pine chips, (2) the amount of nonpine black liquor mixed with pine black liquor prior to evaporation, (3) the degree of seasoning of the pine wood used, (4) the season of the year, and (5) the kind of pine used. In addition to these factors which are difficult to alter, needless to say, suitable equipment must be properly installed and properly operated before good yields are consistently recorded.

TABLE I.—TALL OIL SOURCES IN THE UNITED STATES

State	City	Sulphate or Soda Mill	Pine Pulp Produced 1942 Estimate tons/day	Tall Oil 1942 Estimate lbs. per day Available	Tall Oil 1942 Estimate lbs. per day Produced
Ala.	Mobile	Hollingsworth & Whitney Co.	225	13,000	0
	Mobile	Southern Kraft Corp.	460	28,000	0
	Tuscaloosa	Gulf States Paper Corp.	220	13,000	13,000
Ark.	Camden	Southern Kraft Corp.	355	21,000	0
	Crossett	Crossett Paper Mills	220	13,000	0
Fla.	Fernandina	Container Corporation of America	190	11,000	0
	Jacksonville	National Container Corp.	320	19,000	0
	Panama City	Southern Kraft Corp.	875	52,000	0
	Pensacola	Florida Pulp & Paper Co.	110	7,000	0
	Port St. Joe	St. Joe Paper Co.	350	21,000	0
Ga.	Brunswick	Brunswick Paper Co.	150	9,000	0
	Savannah	Union Bag & Paper Co.	1070	61,000	0
La.	Bastrop	Southern Kraft Corp.	300	18,000	0
	Bogalusa	Gaylord Container Corp.	600	36,000	36,000
	Elizabeth	Calcasieu Sulphate Paper Mills	55	3,000	
	Hodge	Southern Advance Bag & Paper Co.	260	16,000	16,000
	Spring Hill	Southern Kraft Corp.	1075	61,000	0
	West Monroe	Brown Paper Mill Co., Inc.	550	33,000	0
Md.	Luke	West Virginia Pulp & Paper Co.	110	7,000	0
Mich.	Filer City	Filer Paper Co.	100	6,000	0
	Muskegon	Central Paper Co.	120	7,000	0
	Ontonagon	Ontonagon Fiber Corp.	130	8,000	0
Minn.	Cloquet	Northwestern Paper Co.	110	7,000	0
	Internat'l Falls	Minnesota & Ontario Paper Co.	100	6,000	
Miss.	Moss Point	Southern Kraft Corp.	230	14,000	0
N. C.	Canton	Champion Paper & Fibre Co.	455	27,000	27,000
	Plymouth	North Carolina Pulp Co.	450	27,000	0
	Roanoke Rapids	Halifax Paper Co.	130	8,000	0
Pa.	Lock Haven	New York & Pennsylvania Co.	55	4,000	0
	Spring Grove	P. H. Glatfelter Co.	60	4,000	0
	Tyrone	West Virginia Pulp & Paper Co.	100	6,000	0
	Williamsburg	West Virginia Pulp & Paper Co.	45	2,000	0
S. C.	Charleston	West Virginia Pulp & Paper Co.	500	30,000	30,000
	Georgetown	Southern Kraft Corp.	1435	90,000	0
Tenn.	Kingsport	Mead Corporation	100	6,000	0
Texas	Pasadena	Champion Paper & Fibre Co.	325	19,000	19,000
Va.	Covington	West Virginia Pulp & Paper Co.	450	27,000	27,000
	Buena Vista	Columbian Paper Co.	20	1,000	0
	Franklin	Chesapeake Camp Corp.	165	10,000	10,000
	Hopewell	Hummel Ross Fibre Corp.	300	18,000	0
	West Point	Chesapeake Corporation	425	25,000	0
Wis.	Kaukauna	Thilmany Pulp & Paper Co.	125	7,000	0
	Mosinee	Mosinee Paper Mills Co.	100	6,000	0
	Nekoosa	Nekoosa Edwards Paper Co.	150	9,000	0
	Stevens Point	Stevens Point Pulp & Paper Co.	35	2,000	0
	Tomahawk	Tomahawk Kraft Paper Co.	80	5,000	0
		Total		816,000	178,000

Yields vary widely from mill to mill. Thus our records for a number of mills show the average yields given in Table II. Such yields undergo seasonal variations as suggested by Table III.

TABLE II.—TALL OIL YIELDS FROM VARIOUS MILLS

Mill	Tall Oil, Pounds per ton pulp
A	82
B	77
C	68
D	43
E	21
F	15

TABLE III.—SEASONAL VARIATION OF TALL OIL YIELDS

Month	Tall Oil, pounds per ton pulp — Mill A	Mill B
January	82	44
February	92	86
March	88	109
April	80	93
May	72	96
June	102	88
July	72	78
August	74	77
September	77	65
October	86	57
November	71	67
December	74	60

Clearly, a plan can hardly be outlined until interested mills begin accumulating test data that will supply the answer to the question of how much skimmings and so, tall oil, could be made available. This is easy to do. Those mills already separating the skimmings need merely accumulate them in a borrowed tank for a sufficient time to ensure a reasonable precision for their weighings and subsequent calculations. Mills not yet separating skimmings can prepare reasonably good estimates by sampling black liquor at an evaporator effect where the solids content of the black liquor is 25 to 30%. By drawing samples of one barrel each and allowing them to stand any available skimmings will float to the top. The floating skimmings are best removed by means of an ordinary soup strainer or, if the chemist must, by some more expensive equivalent. A simple computation, based on the weight of the collected skimmings drained free of black liquor, the solids in the black liquor sampled, and the liquor solids per ton of pulp, affords a fair estimate of the skimmings yield. In good practice the

tall oil yield is half the skimmings yield. A much more reliable revision of Table I, estimating the potentially available tall oil, could be assembled from the data the various mills could so easily collect.

The Recovery of Tall Oil

A number of devices have been proposed for separating crude tall oil skimmings from black liquor but a simple settling tank as shown in Fig. 2 is adequate. Any settling tank where black liquor can be skimmed is satisfactory. The use of additional baffles, paddles, or other accessories usually only decreases the yield due to the turbulence these induce. Black liquor of 20 to 30% solids content gives the best separation. The black liquor streams through such a tank continuously and the skimmings may be removed either continuously or intermittently. Ample storage tanks should be provided for skimmings otherwise an irregular supply of tank cars or operating breakdowns can give rise to a very appreciable waste of skimmings.

The conversion of crude tall oil skimmings to crude tall oil appears to be a very simple chemical operation but like all such, when practiced on a large scale, many problems must be solved before a reliable production of a reproducible and marketable grade can be achieved.

Refined Tall Oil

Many processes for refining tall oil have been proposed but very few have grown to commercial size. The economic problems confronting a tall oil refinery are not generally appreciated and are more serious than the technical problems. Crude tall oil is not easy to market. It has very few unique properties, so far as we know today, except its low price. It is, regrettably, the cheapest organic acid in the world. Until some commercially important special uses are found, crude tall oil must be able to endure the competition of the many other fats, oils, fatty acids, and rosin to which consumers can turn. Refined tall oil must similarly compete with refined fats and fatty acids and, here too, it seldom finds any technical advantage and has so far always sold below them. Many consumers of refined tall oil, when pressed by declining prices for their products, have turned to the use of the lower priced crude tall oil and found the substitution acceptable. For most uses crude tall oil has much the same properties as refined tall oil, but refined tall oil has more eye appeal, gives lighter-colored products and so, when they can afford it, consumers prefer it. With the increasing scarcity of other supplies of fatty acids, the demand for refined tall oil will also increase, but it may be wondered how much of this demand will be made, not because the consumer really needs this quality, but because he has the price and the ordinarily commendable urge to excel among his competitors. But in a country short of fats and oils, short of most metals, and at war, the wisdom of constructing refineries now should be carefully weighed against the actual essential need for refined tall oil.

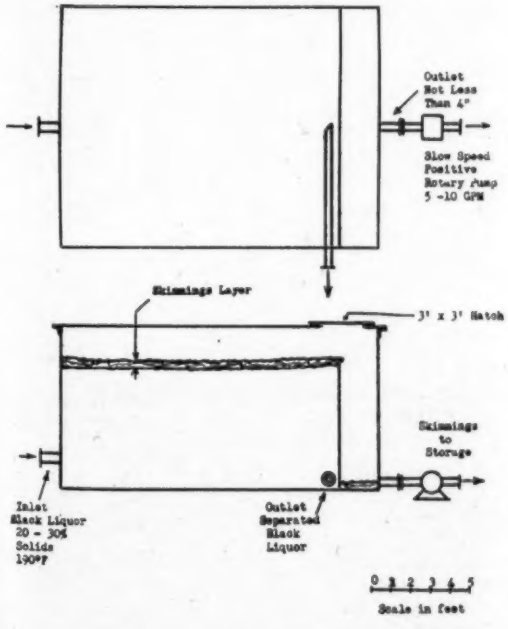

FIG. 2
Separating Tank for Crude Tall Oil Skimmings Dimensioned for 300 Ton Mill.

Most of the refined tall oil that has been made here and abroad is refined by vacuum distillation. Because of high corrosion rates the equipment used is expensive. Operating costs are high because the refineries are small, each refiner not being willing to expand his capacity or to extend his investment much beyond the crude tall oil he can count on for a term of years—his own. Refined tall oil is costly to store and because it darkens in storage, refineries tend to be built oversize so that when demand and prices are high, stored crude tall oil may be refined in addition to the crude currently available.

The more highly tall oil is refined, the lower its yield and the greater the quantity and number of byproducts to be disposed of. For example, unlike the experience in the distillation of other fatty acids, pitch yields are high, varying from 15 to 30%. Such pitches are usually sold at very low prices. The art of tall oil refining is not well known, and the assembly of a competent technical staff, skilled in the technology and general know-how of a practical process, appears to require years of expensive effort.

Some refined tall oil has been and is being made by processes other than vacuum distillation. There are probably also other processes, not yet tried commercially, that may be technically sound but lack the personnel and capital to develop them. The composition of the crude tall oil used is important in considering a refining process. Variations in composition are reflected in variations in yields, refinery capacities, and other operating difficulties so that it is unlikely that any single refining process could be economically applied to tall oil from all sources.

It would seem that while collecting all the available skimmings and converting it to crude tall oil could be accomplished this year, the production of refined tall oil would probably not be achieved so quickly unless great urgency could be demonstrated.

Specifications for Crude Tall Oil

If then, at least at first, the bulk of any increase in tall oil production will appear on the market as crude tall oil, what will it be like? Crude tall oil varies as widely in composition as it does in yield.

The extent of variations in the composition of crude tall oil may be examined in Table IV, giving statistics of many analyses of samples of commercial deliveries of crude tall oil. Examples of specifications for crude tall oil are given in Table V. Other more severe

specifications have also been encountered. In some cases these specifications are aimed at uniformity rather than at any particular composition so that tall oils of odd compositions can sometimes be marketed by careful blending. Even so there will probably remain, from some sources, tall oil of such unusual composition that it would be salable in special cases only.

Tall Oil Uses

Tall oil is a mixture of rosin acids, unsaturated, 18 carbon fatty acids, and unsaponifiable material. Most tall oil does not contain enough unsaponifiables to affect its present uses.

The current uses for tall oil have been generally advertised *(5)*. Its principal uses are in the manufacture of industrial soap products such as cleaning compounds, of oil, asphalt, and disinfectant emulsions, of lubricants, of flotation reagents, of paints, and of many other products.

As an indication of its more essential uses it is noteworthy that in England a recent regulation *(6)* restricts the use of tall oil to the following four kinds of products (1) jointing compounds for airdrome runways, (2) soluble cutting oils including emulsifiers used in the preparation of soluble cutting oils (3) winter washes, (4) disinfectants.

Tall Oil in 1943

Any effort, however urgent the need, to conserve tall oil will encounter two principal production problems. All skimmings must be conserved and skimmings must be converted to crude tall oil. Next are problems of utilization, and the question of refining tall oil is really one of these.

It should not require more than several months from the word "Go" to eliminate the waste of crude

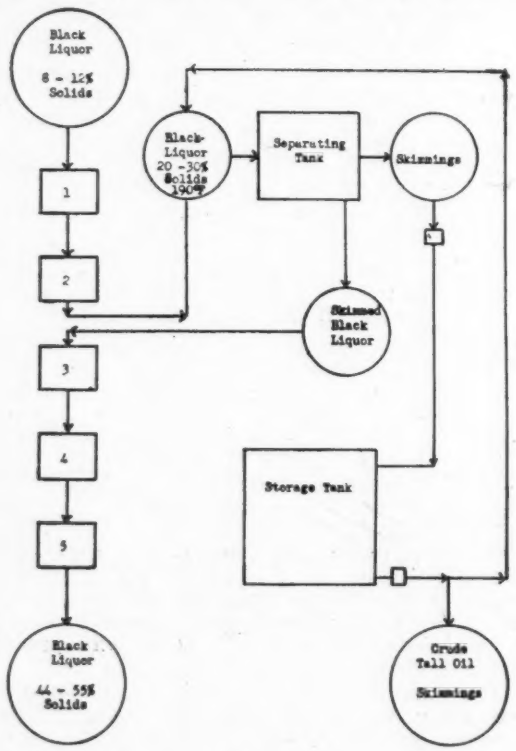

FIG. 3
Equipment Flowsheet for Skimmings

TABLE IV.—ANALYSES OF CRUDE TALL OIL FROM VARIOUS SOURCES

Mill	Values	Rosin Acids, %	Fatty Acids, %	Unsaponifiables, %
A	Average	45	47	7.5
	High and Low	48—44	49—44	8.5—6.7
	Average Deviation	1	1	0.4
	Number of Analyses	234	144	144
B	Average	51	43	8.6
	High and Low	57—45	49—47	10.7—7.5
	Average Deviation	2	2	0.4
	Number of Analyses	103	56	56
C	Average	56	37	7.0
	Number of Analyses	1	1	1
D	Average	38	54	8.4
	High and Low	40—35	56—53	8.9—7.8
	Average Deviation	2		
	Number of Analyses	19	2	2
E	Average	42	54	6.7
	High and Low	44—40	55—54	6.8—6.7
	Average Deviation	1		
	Number of Analyses	16	2	2
F	Average	40		
	High and Low	44—34		
	Average Deviation	2		
	Number of Analyses	68		
G	Average	40	54	7.2
	High and Low	44—37	56—53	7.4—7.1
	Average Deviation	2	1	0.2
	Number of Analyses	51	8	8
H	Average	42	51	6.7
	Number of Analyses	2	1	1
I	Average	42	39	18.1
	High and Low	47—40	42—37	22.2—13.9
	Average Deviation	2	2	2.9
	Number of Analyses	15	15	15
J	Average	44	50	7.5
	High and Low	45—43	50—49	7.9—7.0
	Average Deviation	1		
	Number of Analyses	5	2	2
K	Average	44	50	5.6
L	Average	39	52	8.5
	High and Low	40—38	53—51	8.9—8.2
	Average Deviation	1	1	0.3
	Number of Analyses	4	4	4
M	Average	47	46	7.8
	High and Low	48—46	46—45	7.8—7.7
	Number of Analyses	3	2	2
N	Average	38	52	6.9
	High and Low	39—38	55—49	
	Number of Analyses	4	2	1
O	Average	58	36	6.5
	High and Low	64—52	41—30	7.8—5.5
	Average Deviation	4	3	0.8
	Number of Analyses	7	7	7

TABLE V.—COMPARISON OF TALL OIL SPECIFICATIONS

Item	Specification A	B [1]	C [2]
PHYSICAL DATA			
Specific Gravity 60° F./60° F.	0.97—0.99	0.96—1.0	0.96—1.00
Pour Point	not over 45°F.	[3]	[4]
Viscosity SSU at 210° F.	95—120	none	none
Flash Point	350—370	none	none
Fire Point	410—430	none	none
Color	brown	none	none
Moisture, %	less than 0.4	not over 1.5	less than 1.0
CHEMICAL DATA			
Acid Number	160—170	not less than 140	not less than 150
Saponification Number	165—175	160—180	not less than 150
Rosin Acids Number	80— 90	none	none
Iodine Number (Wijs)	140—150	none	none
Ash, %	less than 0.4	not over 0.5	not over 0.5
ANALYSIS			
Fatty Acids, %	45—50	not less than 50	not less than 30
Rosin Acids, % (calculated as abietic)	42—48	40—60	not over 60
Unsaponifiables, %	6— 9	not over 10	not over 10

[1] Material: The material to be furnished under these specifications consists of the natural mixture of resinous and fatty acids obtained by acidulating the digester liquors obtained in the process of converting pine wood to paper pulp by the sulphate process, followed by suitable refining process.

[2] The natural mixture of fatty and rosin acids obtained by acidulating the skimmings from the black liquor obtained in pulping pine wood by the soda or sulphate process, followed by a suitable refining process.

[3] Consistency and appearance: The material shall be a viscous, unctuous, fluid mass, which at first may be more or less uniform but on standing may separate into a top liquid layer of fatty acid and a bottom crystallized layer of resin acid.

[4] At 70° F. the material shall be a viscous, unctuous, fluid mass from which rosin acids may crystallize out on standing.

tall oil skimmings. Many potential sources of skimmings are already separating some because this improves evaporator efficiency. Having organized no outlet for this material it is being burned for fuel or wasted. Such mills need only to improve their present equipment. Mills having no separating equipment could readily put together a tank equivalent to that in the sketch of Fig. 2, from surplus or from second hand equipment. Figure 3 shows a suitable arrangement of equipment for the efficient collection of skimmings. Very little, if any, critical materials need be involved.

The conversion of skimmings to crude tall oil presents a somewhat greater problem in that it requires appreciable capital, critical materials, and technical personnel. Since there is already in almost all cases a nearby producer of crude tall oil, it would appear reasonable for the duration of the War to have the existing tall oil producers convert the skimmings available from all nearby sources. Where such a producer is operating only 8 hours, he could operate 24 hours, and even if he is already operating at full capacity, only a relatively minor quantity of critical materials and labor would enable him to enlarge his existing capacity to meet the needs in his area. The regional grouping implied by Fig. 1 is only by way of an example, rather than a proposed grouping. It would be one part of our cooperative task to devise a grouping acceptable to all concerned.

One great advantage in bringing crude tall oil to the market by moving skimmings through regional converting plants would be that the considerable variations in composition among mills could be minimized by blending. Unless this is done all the tall oil will not be salable simply because, war or no war, it will not all meet the specifications which buyers will insist on.

The problems of utilizing the additional production of tall oil depend, in our opinion, on just how scarce fats and oil will actually become and also on the progress of the considerable amount of research and development work now directed to the increased utilization of crude tall oil. It is too early for us to offer a definite opinion on the real need for more tall oil refinery capacity.

TAPPI Members from soda or sulphate mills using pinewood could do much to expedite a program fair and agreeable to all by beginning the accumulation of data on tall oil skimmings which the War Production Board, or for that matter, any other authorities must have before intelligent decisions can be made and effective action taken.

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Drainage and Steam for Paper Machine Driers*

By Roderick O'Donoghue[1]

Abstract

The fundamental principles underlying the action of steam in driers, how these are used, and their effect on certain objectives desired to be obtained in a drier system are discussed.

The causes of low heat transfer from driers are given.

Drier drainage systems are reviewed.

A graduated temperature control for low pressures is described.

Drier surface temperatures are analysed.

There are mills that would like to improve their drier systems to meet certain requirements and are handicapped due to wartime restrictions. These requirements might be in one or more of the following directions: (1) increased evaporation per square foot of drier surface (2) reduced drying temperatures, (3) graduated drier temperatures, (4) greater drier steam economy, (5) more uniform drying, and (6) decreased mechanical load on drier section.

A correct conception of the fundamental principles involved in the use of the steam supplied to the driers of a pulp, paper, and paperboard machine should go far in solving the particular problem.

Steam Economy

In a broad sense we should be concerned with the total steam used in the overall drying operation. What is used for felts, ventilation, and vapor absorption systems will affect the amount used in the driers. This paper, however, will be confined to that used in the driers. The amount of steam supplied to the driers is no correct measure of the work done by it, unless we consider the amount of condensate and steam leaving the drainage system. In a true sense the proper gage is the number of British thermal units actually transferred to the driers per pound of water evaporated from the sheet per square foot of drier surface. A common practice is to give results in terms of pounds of steam used. This neglects the amount of unused heat in the condensate, and the difference in heat content of steam and condensate due to pressure. It would be desirable to use "equivalent" pounds of steam from and at 212° F., and in this way all records would be on a comparative basis.

There may be a large amount of uncondensed steam leaving the drainage system. As long as this steam or the hot condensate is used economically elsewhere in the process there is no cause to object; but, in general, it is found more desirable to close

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up the drainage system if for no better reason than to know definitely how much heat is actually used in the driers and to have independent control of the steam used elsewhere in the mill.

As steam used for drying usually is at low pressure, it is more economical to use that which has been reduced in pressure after doing useful work in prime movers, the steam cost being adjusted to suit. There may be distinct advantage to reduce this pressure to a minimum and thus reduce the back pressure on prime movers so as to generate as much power as possible.

Steam Quality

Drier condensate should be returned to the boilers for two reasons. It is pure water and requires no treatment unless contaminated with oil from engines. If returned hot, it has little entrained noncondensable gases, and it is important that the steam used in the driers have as little as possible. Raw water and the treatment given it may so increase the amount of noncondensable gases as to lessen drier efficiency.

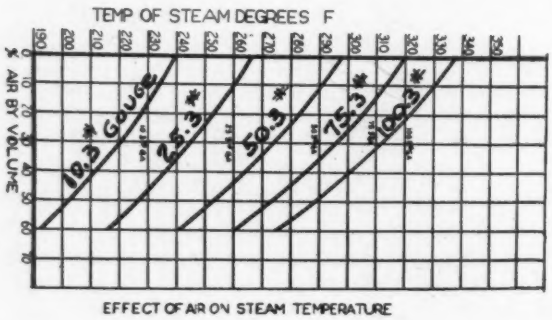
Tatley (1) mentions the amount of noncondensable gases (hereafter referred to as "air" for simplicity) in the steam entering driers on a certain test to vary between 0.0025 and 0.005% by volume. Assuming the latter figure, this would mean a 48 inch diameter by 98 inch face drier condensing an average of 360 pounds of steam per hour supplied at 10 p.s.i. pressure would contain 10% air in about 30 hours if no provision were made to eliminate it. More air would reduce this time.

This amount would (Figs. 1 and 2) reduce the steam temperature in the drier from about 240 to 233°F. and decrease the heat transfer to the drier about 30%.

Tests should be made to check the amount of air in the steam supply to the driers, and to reduce it if large.

The use of superheated steam is of questionable advantage, because its heat transfer value is less than that of saturated steam. The specific heat of superheated steam is about 0.5, therefore 50°F. superheat would give up only 25 B. t. u. in falling to the saturation point as compared to about 1000 B. t. u. for the same amount while condensing.

Sand well *(2)* showed by thermocouples installed near the surface inside an operating drier that with 50°F. superheat, the temperature at the back end was 28°F. above saturated steam temperature and 29°F. higher than at the front. This occurred when there was no accumulation of condensate and the drier was



EFFECT OF AIR ON STEAM TEMPERATURE

FIG. 1

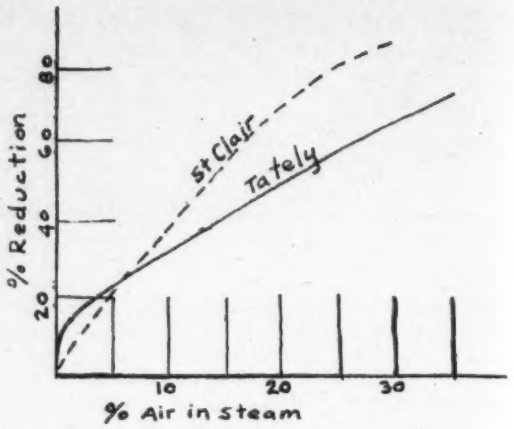


FIG. 2
Reduction in Heat Transfer Due to Air in Steam

"blowing" steam freely. He then closed the condensate line and allowed several inches of condensate to accumulate as a puddle in the drier. The temperature at the back end was 6°F. above the saturated temperature and 8½°F. above the front end. He concluded that some accumulation of water evened out the temperatures and that free "blowing" caused temperature differentials when using superheated steam.

Causes of Low-Heat Transfer

The usual factors affecting drier heat transfer are: (1) steam pressure in drier, (2) air in steam, (3) water in drier, (4) coating on inside of drier, (5) coating on outside of drier and rough surfaces, (6) poor contact of sheet to drier, (7) thickness of shell and material used in construction of driers, (8) drier contact area, (9) temperature and moisture content of contacting sheet.

1. Steam Pressure

What we are trying to accomplish with a drier is to maintain a temperature differential between the drier surface and the sheet. As this increases, the flow of heat is increased. An analogy is in the flow of water in a pipe. As the head is increased, the volume of water will likewise increase.

The average overall temperature differential for a paper machine depends among other things on the amount of water to be evaporated and the available square feet of heating surface. The differential will vary from drier to drier depending on the surface temperature of the drier and that of the sheet and the rate of heat transfer from one to the other. It may be necessary to limit heat transfer at the early stages so as to prevent blowing, searing, cockles, and too rapid shrinkage. As the temperature of the sheet increases, higher drier temperatures are desirable to get the required heat transfer. Therefor, it may be an advantage to have the driers broken up into various pressure sections, especially where it is necessary to make the most of a limited drier surface.

2. Air in Steam

Air and steam when once mixed cannot separate in the drier to form pockets as some claim. The "law of diffusion of gasses" and the movement due to incoming steam and the revolving drier preclude this.

Therefore, to eliminate air, we must discharge steam as well.

To verify that the law of diffusion of gasses was no exception in a drier, Tatley *(1)* took samples from the inside of an operating 6-foot diameter drier with the following results:

3 tests 2 inches from inside top of drier shell—av.....	2.29% air
3 tests 2 inches from inside bottom of drier shell—av.....	2.28% air
3 tests at the middle of drier shell—av.....	2.31% air

The effect of air in steam is to lower the steam temperature at a given pressure and to reduce the coefficient of heat transfer.

St. Clair *(3)* shows in Fig. 1 the effect of various percentages of air on steam temperature for certain pressures. This is in accordance with Dalton's Law.

What we are chiefly interested in is the effect of air on heat transfer to the drier shell. We all know that confined air is an insulator. For instance the conductivity coefficient for iron is about 3000 times as great as for air when at rest. When in motion this relationship is greatly changed. The air and steam in the body of the drier are in motion. However, as steam condenses on the surface of the drier, a thin and comparatively motionless layer of air may be formed causing a reduction in heat transfer.

We know of no actual tests on driers with various percentages of air. Work of this nature has been carried out on surface condensers and Tatley *(1)* gives Fig. 2 which shows the expected reduction of heat transfer for various percentages of air. In dotted lines is another similar curve given by St. Clair (2). These roughly show 5% air in a drier will reduce heat transfer 20%, indicating the importance of removing air. When a paper machine is started up, the driers are full of air. Sandwell *(2)* made tests to show it took 30 to 90 minutes to eliminate most of this. His curves showed a minimum of 0.0031% air by volume in the driers, these being under positive pressure.

3. Water in Drier

The conductivity coefficient of iron is about 100 times that of water. This indicates water would be a good insulation if at rest, but this condition does not hold true in a revolving drier. At slow speed a puddle is formed in the bottom while thin film of condensate or dropwise condensation (4, 5) covers the remaining surface.

Jakob states that clean steam condenses in the form of a film on clean surfaces whether they are rough or polished. However, if the surface is contaminated and the substance strongly adsorbed to the surface making it non-wettable, condensation forms in drops of constant size. The effect of dropwise condensation is to increase the rate of condensation on the same area 15 to 19 times greater than with film condensation. Agents can be added to steam to promote dropwise condensation.

We do not know the type of condensation forming in driers under operating conditions, but the above information would indicate a study should be made to determine if improvement in heat transfer is possible.

Stamm *(6)* minimizes the effect of the film and also of the puddle on heat transfer stating that the actual drop in temperature through the water film is not over 1° F., and that there was no drop in surface temperature as a drier under observation filled up. Some may question this latter observation from their own experiences that a cold drier is filled with water. This, however, may be caused by restriction of the steam inlet so that sufficient steam is not supplied to maintain temperature or there may be an accumulation of "air".

At high drier speeds, centrifugal force changes the puddle to a solid ring or film of water extending around the entire periphery of the drier. There is some "slip" between the iron surface and this ring so that the water is not at rest, but if this ring is not kept small in depth we should expect some insulating effect.

Theoretically this ring forms at a face speed of 560 f.p.m. on a 5-foot drier according to Malkin *(7)* but actually at a higher speed depending on the amount of condensate and slip. He explains how paddles can be installed in high-speed machines to reduce the ring thickness and stabilize (and reduce) the power load. These are diagonal angles which reduce slip and move the ring towards the syphon pipe, and the effect is said to decrease the power load as much as 50% when used with a good condensate removal system *(5, 7)*.

4, 5, 6. Coating on Inside and Outside of Drier and Poor Sheet Contact to Drier

These are factors which may be of considerable importance when faulty operating conditions exist and the means of correcting them should be self-evident.

The effect of good contact of sheet to drier and a highly polished surface is emphasized when we compare evaporation rates with a Yankee drier which may be five times as great.

7. Thickness of Shell and Material Used

The use of cast iron has been dictated by practical considerations. Some fabricated steel driers have been built using thinner shells for the same pressure with claims of a possible heat transfer per unit area nearly in proportion to the thickness. This ignores film coefficients which are of dominant importance.

8. Drier Contact Area

Drier contact areas usually vary between 50 and 66%, and even larger on Yankee driers.

Large contact area is particularly desirable on feltless machines where evaporation takes place up to the end of contact with the drier.

Cowan *(8)* takes the view that a felt is an insulator and that most evaporation takes place between the draws. If this were so there would be a limit to worthwhile drier contact area and diameter of driers with a consequent increase in the number required where felts are used.

Steam Joints and Syphons

A good steam joint will not suck in oil or air when the drier is under vacuum, and will not blow steam when under pressure. Its pipe sizes should be ample for all possible conditions. A drier supplied with steam at 10 p.s.i. abs. pressure will receive over 5 times the volume it would at 60 pounds for the same weight of steam. Because of restricted pipe sizes there may be a considerable error in assuming that the pressure in the drier is the same as in the supply header.

A syphon pipe can function as a real syphon or as an orifice.

Where the condensate return line is closed as with individual traps or check valves, sufficient water must accumulate in the drier to seal the end of the syphon.

Steam sealed in the return line will condense reducing the pressure and cause water to rise in the syphon pipe until it overflows and forms a real syphoning action. This will continue until the end of the pipe is unsealed and enough vapor enters to break the syphon. The cycle is then repeated. The "head" required to start syphon action is that from the water level in the drier to the top of the syphon pipe plus that required to overcome friction in the pipe line and to give velocity to the water. After once started the "head" required is only that to overcome friction and produce velocity. The disadvantage of cyclic operation is that heat transfer may not be uniform and drier load will vary.

In a "blow through" system, there is maintained a pressure differential between the return header and the inside of the drier to make water rise in the syphon pipe and then flow out. This is greater than is necessary to continue the syphoning action once started and as a result some vapor is carried out too. If the pressure differential is too great and the syphon pipe too large, a considerable amount of vapor will be carried over making more condensing driers necessary as will be discussed later. A solution is to restrict the end of the syphon pipe so as to give such a high velocity at the inlet that a continuous stream of condensate and the proper amount of vapor is carried out.

To keep water in driers to a minmum, the syphon ends should be adjusted close to the drier shell. They will not function right if there are leaks in the syphon line.

If syphon pipe is not functioning, water will build up until it spills out the return line. This is objectionable because of the extra load to revolve driers and insulating effect of water as already discussed.

Drier Drainage Systems

There are two general types of systems as follows: (1) individual traps and (2) "blow-through".

There are other systems such as check valves and steam syphons on individual driers but their use and possible advantages are too limited to discuss in this short paper.

(1) Individual traps—Years ago many driers were simply equipped with a valve on the return line and this was periodically opened to blow out the accumulated condensate. Then traps were installed to do this automatically. If a trap is properly sealed to prevent steam blowing then air will accumulate in the drier. Bypasses were installed to periodically relieve this condition by "blowing" past the trap. Then the trap was arranged to continually "blow" so as to relieve air. -This practice is now more or less general so that we have in effect a blow-through system with need for some means such as condensing driers to take care of the excess steam. Here in effect we have the anamolly of traps installed to prevent passage of steam being provided with orifices so that steam and air can pass by them.

This statement does not mean that individual drier traps are condemned, because there are conditions where they serve a useful purpose if properly installed.

(2) Blow-Through system—From the use of traps as just described came the idea of blowing steam from one set of driers at the dry end into the next set which would act as condensers and thereby produce the necessary pressure differential to produce a flow of steam, air, and condensate. It is possible to carry this idea to the extreme of passing in series from one individual drier to another the full length of the drier section, but this in general would not be practical as the pressure drop over the machine would be excessive. It is common, however, to have the driers divided up into two, three, and sometimes four sections.

Figure 3 shows a typical arrangement with three sections for a machine with 28 driers. There are four different steam pressures on the system, giving three pressure differentials, each of which is say three to five pounds. To properly design a system as shown we must know the condensation rates for each individual drier. Figure 4 shows the results of a condensate test on a machine with twenty-eight 48 by 98-inch driers running 540 f.p.m. when making 32 pounds news with 10 pounds pressure on the driers (9).

From this type of data the number of driers in each section can be proportioned. To do this properly it is necessary to restrict the amount of blow-through from each individual drier, otherwise there would be too many condensing driers. Theoretically we are interested in having enough blow-through to be assured that air is eliminated. Another consideration sometimes desired is to have a reduced temperature on a number of wet end driers to help eliminate cockles, blisters, etc. The restriction of blow-through can be accomplished by orifices on the ends of the syphon pipes or in the return lines from the driers. In the latter case, an orifice whose opening can be adjusted is desirable.

It can be seen from Fig. 4 that the rate of conden-

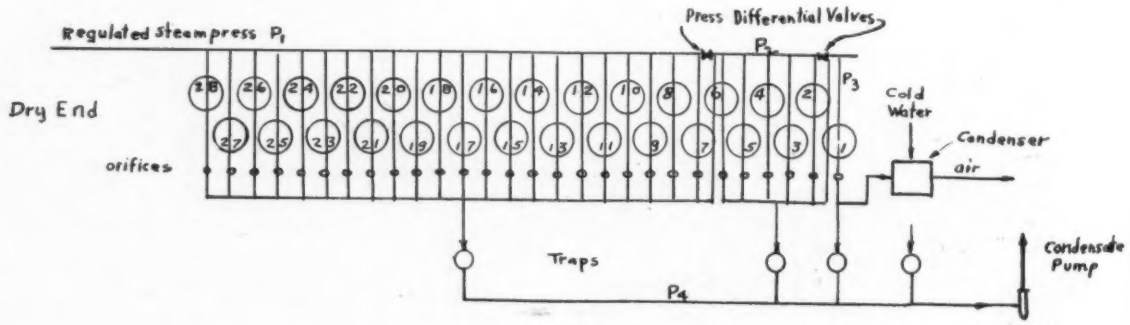


FIG. 3
Continuous Blowthrough System

sate discharge varies considerably from individual driers, especially at the wet end. If orifices are not of the proper size, the amount of blow-through may vary considerably.

What will happen if machine conditions change? Assume the amount of water in the sheet increases. To get the same final moisture content, the primary steam pressure must be raised and more steam is condensed. The differential between sections is automatically increased and this increases the flow from each drier for the same orifice size.

It is usual to have the amount of blow-through and flash steam to the condensing section less than the steam required. The effect would be to make the pressure differentials too large without some balancing arrangement. This is accomplished by pressure differential valves or devices between sections which admit makeup steam to the lower pressure section when the pressure differential is above a fixed amount. Very often these valves are too large or not controlled delicately enough so that the amount of steam flow varies widely and a "hunting" action is produced with consequent irregular drying.

In a blow-through system all air finally reaches the last condensing section which in this case is drier No. 1. The condensate discharge line contains steam as well as air and can be passed through a condenser to recover the heat before the air alone is expelled. A vacuum pump may be necessary to do this. Condensate from all sections is trapped and may be returned to the boilers.

Figure 3 is a typical lay-out to illustrate the fundamentals of a blow-through system. There are over a half dozen companies selling this type of system, all of whom have special features to offer—e. g., the type and location of orifices, percentage of driers in condensing sections, use of steam separators and condensate tanks, and the methods of finally removing air from the system.

Flash Steam

The amount of steam obtained as flash steam due to the drop in pressure between sections is a comparatively small amount.

For instance, if we take the arrangement as shown in Fig. 3 and the amounts of condensate shown in Fig. 4, the amount of condensate from driers 7 to 28, inclusive, is 5565 pounds and that from driers 1 to 6, inclusive, is 2193 pounds per hour. Assume the steam supply is 10 p.s.i. and the pressure drop over the primary section is 5 pounds, from steam tables, the amount of flash steam is 72 pounds which is a small percentage of that required in the condensing sections.

Graduated Temperature Control

At the wet end it is generally desired to increase gradually the drier surface temperature so as not to heat the sheet up too quickly. On some special papers it may be desirable to reduce the surface temperature to say 140°F. on the first drier and gradually increase it to 212°F. on the next four or five driers. Steam at 140°F. is at negative pressure of 24 inches Hg. Such a high vacuum would cause an unknown and uncontrollabe air leakage into the drier. Stamm *(10)* has worked out an arrangement to obtain controlled temperatures in this range by *admitting* air to the drier. This is shown in Fig. 5. A small bulb is located near the bottom of the syphon pipe and it is partially filled with acetone as the expanding

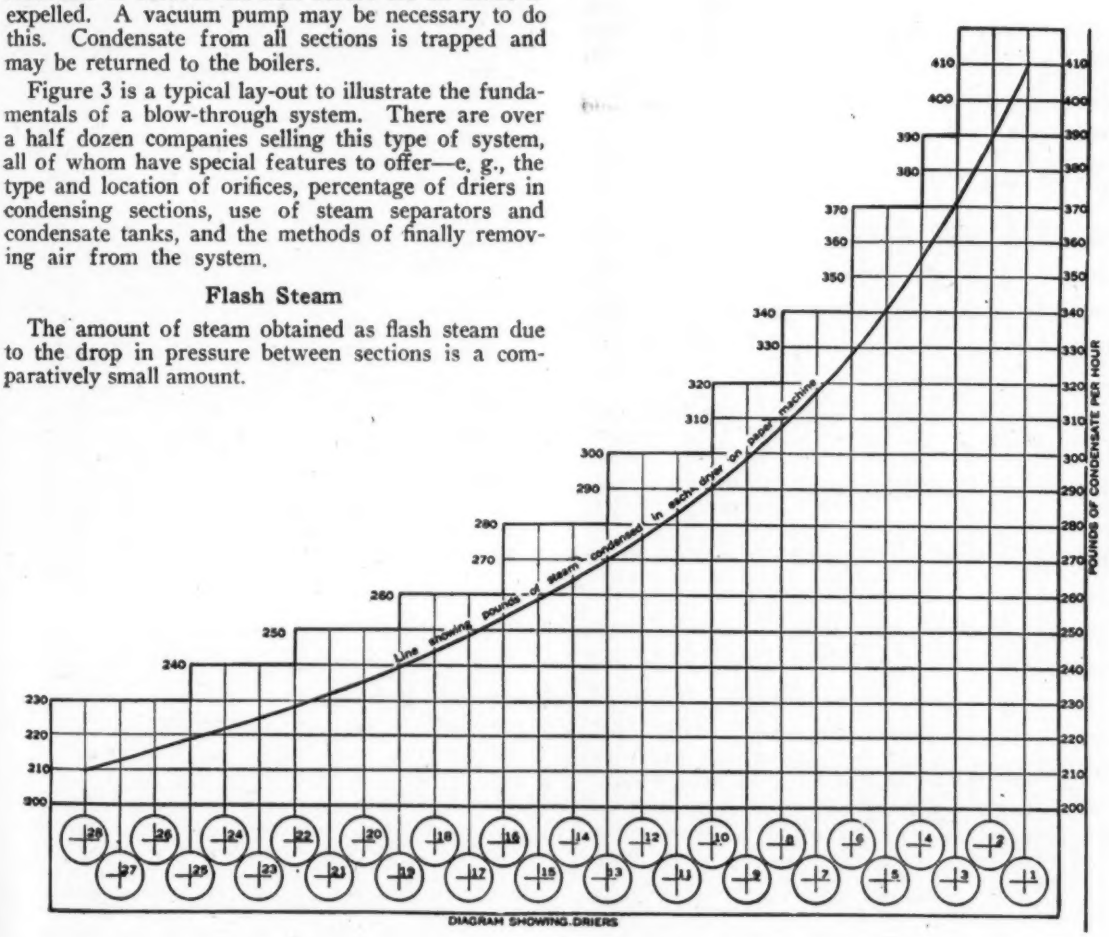

Line showing pounds of steam condensed in each dryer on paper machine
POUNDS OF CONDENSATE PER HOUR
DIAGRAM SHOWING DRIERS

FIG. 4
Condensate from Driers on Paper Machine

medium. This is connected by tubing to the bellows *L*. There is a direct relationship between the temperature in the drier and the pressure exerted on the bellows. Any excess temperature will cause the bellows to expand and operate a pilot air valve *N* which decreases the pressure on the diaphragm steam valve *C* causing it to close. As steam continues to condense in the drier, the pressure will be reduced below atmospheric causing the check valve *D* to open and admit air to the drier until the desired temperature is reached.

When the temperature falls below this point, the reduced pressure on bellows *L* will open the pilot air valve *N* and increase the pressure on the diaphragm of steam valve *C*. This will admit steam to the drier and correct the temperature. Movement of bellows *L* is resisted by springs and tension on which can be adjusted by hand, and by bellows *M* pressure on which is adjusted by air pressure regulator *C*. The reason for this combination is as follows: Assume four driers have been regulated for graduated temperature of 150, 160, 175, and 190°F. by means of the springs. Adjusting air pressure regulator *G* will raise or lower the temperature in all four driers uniformly without changing the individual spring settings. This makes remote control possible.

Drier Surface Temperature

Stamm *(6)* states the average machine drying about 1 pound of paper per square foot per hour should have only 10-12°F. average drop in temperature between steam inside the drier and the outside surface; this drop is about 15°F at the wet and 5°F. at the dry end; that a drop of 5°F. below these is equivalent to 10% less drier capacity, and one of 20°F of 50% less capacity.

MacNaughton *(11)* gives graphs showing steam and drier surface temperatures which are interesting. For 22 machines, the average difference in temperature is 20°F. the minimum is given as 6°F. and the maximum 45°F.

Another noticeable feature is the "sawtooth" rise and fall in temperature of 10 to 40°F. between top and bottom driers on such graphs, the cause of which is unexplained. Possible factors are the condition of the drier felts, and the air and vapor surrounding these driers.

The surface pyrometer should be used as a regular routine to check up on the operation of individual driers. It will indicate those which are water logged or air bound, and usually these troubles are due to defective syphon pipes or a poorly functioning drainage system.

Control of Water in Paper

The effect of removing a maximum amount of water at the presses and leaving in as much as possible at the dry end is to reduce the pressure on the driers and the amount of steam used per pound of paper or to make possible a greater paper production.

Assuming a final moisture content of 8% and that it requires 1.4 pounds of steam at 240°F. to evaporate a pound of water in the driers, 250 pounds more steam per ton of paper will be required for each additional per cent of water in the paper entering the drier section. MacNaughton *(12)* gives information in connection with this subject.

The moisture remaining in paper usually varies

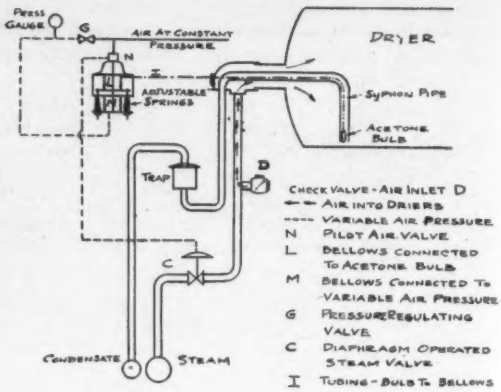


FIG. 5
Graduated Temperature Control

between 2.5 and 10%. When you get near these figures, any further drying is at the expence of disproportionately greater drier surface or higher steam pressures. Overdrying should therefore be controlled. Wet streaks may often be traced back to poor sheet formation.

Felt Driers

A factor in the drying capacity of a machine using drier felts is the proper use of felt driers (or air) to dry the felts, and raise their temperature. This water can be a good percentage of the total evaporated from the sheet depending on the type of felts used and other factors. The number and location of felt driers and the method of "draping" the felts on them must be studied independently for each condition.

MacNaughton *(9)* reports felt driers for 50 newsprint machines. The percentage of total heated drier surface varies from 0 to 19% with an average of 7.55%. There are cases where the percentage of drier surface is even greater than the maximum figure just mentioned. Montgomery *(13)* reports a machine having 42% of its total area in felt driers and a comparison of its drying rates with other machines indicates the number is excessive.

Conclusion

A careful analysis of the way steam and condensate are handled on any paper machine may make it possible to obtain one or more of the six objectives outlined at the beginning of this article without any major changes in equipment.

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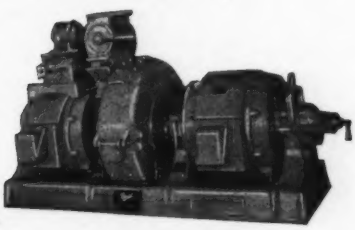

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New York Paper and Pulp Market Review

Paper Demand Continues Heavy As Serious Shortage of Chemical Wood Pulp Becomes More Widely Reported—Value of Manufacturers' Inventories and Shipments Is High — Waste Paper Strong.

Office of the PAPER TRADE JOURNAL.
Wednesday, July 21, 1943.

Wholesale demand for paper is rather widely reported as heavy at this date, with the market situation in all lines strong. Current reports from many manufacturers' representatives, jobbers, and general paper merchants, reflect the grave concern with which the paper industry views prospects for the future.

The unmistakable essentiality of many types of paper for the varied daily uses of military and civilian activities, would seem sufficient to warrant a more rational, cooperative consideration by government agencies. Lack of proper understanding in Washington, however, is unfortunate in its reaction in the minds of civilians and sensible corrective measures should be taken to strengthen the neglected home front.

The index of general business activity for the week ended July 10, declined to 137.7, from 137.9 for the previous week, compared with 126.5 for the corresponding week last year. The index of paper board production was 133.2, compared with 151.2 for the previous week, and with 163.7 for the corresponding week last year.

Paper production for the week ended July 10, a holiday week, was estimated at 67.1%, compared with 69.7% for 1942, with 95.2% for 1941, with 91.1% for 1940, and with 81.8% for the corresponding week for 1939.

Paper board production for the week ended July 10 was 69.0%, compared with 77.0% for 1941, with 72.0% for 1940, and with 71.0% for the corresponding week for 1939.

Total shipments of manufacturers reached a record average in February, 1943, of $142.5 billion, states the U. S. Department of Commerce in its Industry Survey for May, just issued. Shipments for May were down 4% from February and 2.9% below April, 1943. June sales are not expected to exceed those of May.

The Department's index of the value of manufacturers' inventories, total of all industries, was 175.6 for May, compared with the year's high of 177.8 in January; total durable goods, 212.7 for May; total non-durable goods, 143.2.

The index of value of manufacturers' inventories in paper and allied products for May was 136.1, compared with the year's high of 141.4 in January and with 145.9 for May, 1942.

The index of the value of manufacturers' shipments in paper and allied products for May was 159, compared with 138 for January, and with 154 for May, 1942.

Paper bag sizes, states the Office of War Information, have been cut from 284 to 117, saving 80,000 tons of wood pulp, the use of 4,000 freight cars and effected a reduction in manpower hours from 13 to 17%.

Wood Pulp

Scarcity of wood pulp for all but the most vital needs, is the current prospect for the future, unless some government agencies take measures promptly to remedy the situation. A more optimistic note comes from the U. S. Forest Service, which states that the increased integration of pulpwood production with lumbering, could produce wood from the tops and other parts of trees, which could be made into pulp for paper making. It holds the opinion that broadly, the United States is at present self-sufficient for pulpwood for sulphate and soda pulps. This is not true, however, it states, for sulphate and groundwood pulps. About 70% of the readily available pulpwood of spruce, fir, and hemlock is in Canada.

Rags

The new cotton rag market is active. Mill buying of the new colored grades is good, with only a fair movement of new shirt cuttings and unbleached.

Old rags in the roofing grades are active as mills continue to take substantial tonnages. Most prices of new and old rags are firm at ceilings.

Old Rope and Bagging

Trading in old rope continues active. Demand for old No. 1 Manila rope continues strong and demand for hemp fiber is reported inadequate to meet current requirements.

Scrap bagging prices continue nominal. Trading is on a cautious, limited scale.

Old Waste Paper

The paper stock market is reported strong under the reports of future pulp shortage. More waste paper stock is now being utilized for paper production, and this situation, several reports state, is almost certain to steadily increase with the declining supply of wood pulp.

Twine

No important change in the market situation in twine has been reported at this date. Prices are firm under a heavy demand for all standard grades of twine and cordage.

Gero Paper Tube Co. Incorporates

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., July 12, 1943—The Gero Paper Tube Company, Inc., paper and paper products, 40 Court street, has been incorporated with a capital stock of $50,000; 500 preferred shares $100 each, 1,500 common shares of no par value. Herman L. Shaw is president; Lawrence H. Oppenheim, 244 Fisher avenue, Brookline, Mass., treasurer, and Israel Z. Roisen, clerk.

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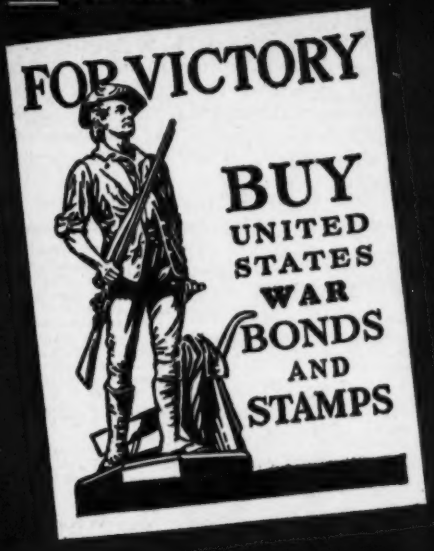

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, July 21, 1943.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton f.o.b., works. Demand reported fair for the week.

BLEACHING POWDER—Prices on bleaching powder are firm. Current demand reported active. Bleaching powder is currently quoted at $2.50 per 100 pounds, in drums, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b., shipping point.

CAUSTIC SODA—Prices on caustic soda are reported unchanged. Supply for the current week is reported tight. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Government demand for war use continues heavy. Prices firm. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are higher for the current week. "G" gum rosin is currently quoted at $3.67 per 100 pounds in barrels, Savannah. "FF" wood rosin is currently quoted at $3.55 per 100 pounds in barrels, New York. Seventy per cent gum rosin size is currently quoted at $3.86 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand reported light for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand heavy. Quotations on soda ash in car lots, per 100 pounds, are as follows; in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are unchanged for the current week. Supply situation tight. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Supply more limited for the current week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are firm and continue to conform to prevailing market quotations Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	*$54.00	@	—
Sheets	62.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.60	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@$15.30
No. 2 Glossy Coated	12.40 " 14.00
No. 3 Glossy Coated	11.60 " 13.25
No. 4 Glossy Coated	11.15 " 12.75
No. 1 Antique (watermarked)	10.25 " 11.75
No. 2 Offset	9.60 " 11.00
A Grade E. F.	9.35 " 10.75
A Grade S. & S. C.	9.60 " 11.00
B Grade E. F.	8.85 " 10.25
B Grade S. & S. C.	9.10 " 10.50
C Grade E. F.	8.55 " 9.75
C Grade S. & S. C.	8.80 " 10.00
D Grade E. F.	8.25 " 9.50
D Grade S. & S. C.	8.50 " 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	65.00@ 66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags (Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

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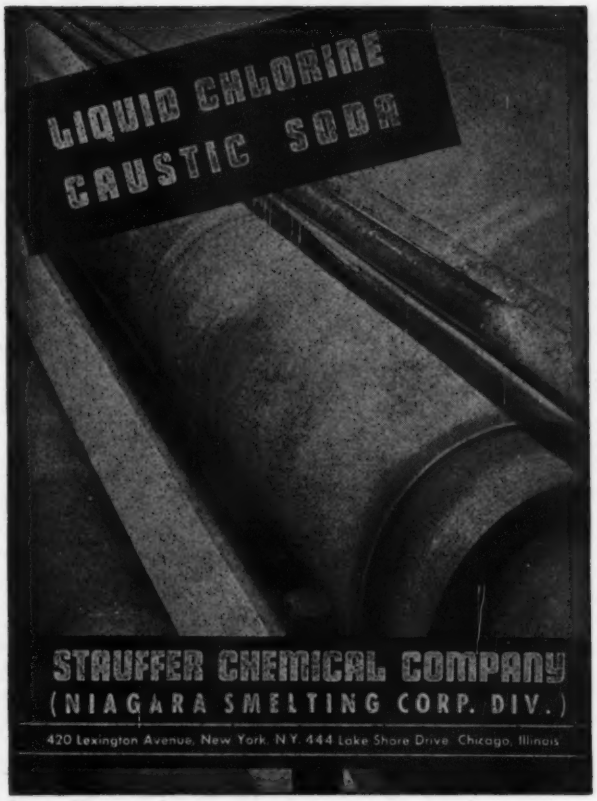
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NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila		"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07½	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¼	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed	1.00	"	1.50
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.15	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.75	@	4.00
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.60	"	3.85
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	4.65	"	4.87½
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No 1.	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¾
New Black Silesias	.03	"	.03¾
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¾	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—